"THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

VOL. XXII. No. 547.] LONDON, SEPTEMBER 9, 1873. [25TH YEAR.] Price 1s.

RAMSAY'S NEWCASTLE CANNEL COAL. Analysis—10,000 cubic feet of gas per ton of coal; 26-candle gas; 13¼ cwt. coke per ton of coal.
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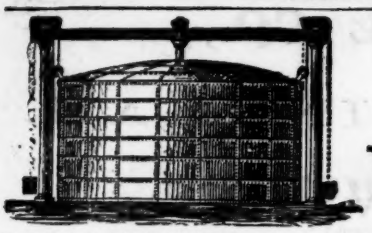

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Which are now so extensively used.

During the last year these Valves have been introduced into some of the large gas-works in London, where they are giving the greatest satisfaction. Favourable reports have been received from the engineers of these and of some of the most important works in the kingdom. The demand for them both for home and foreign works continues unabated.

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Plans of gas-works are carefully prepared, and every improvement which long practical experience can give is introduced into works entrusted to the care of the Advertisers.

References can be given to the Directors of many Companies who have placed works in their hands, and who will testify to the satisfactory results of so doing.

MESSRS. NEWTON, CHAMBERS, & CO.,

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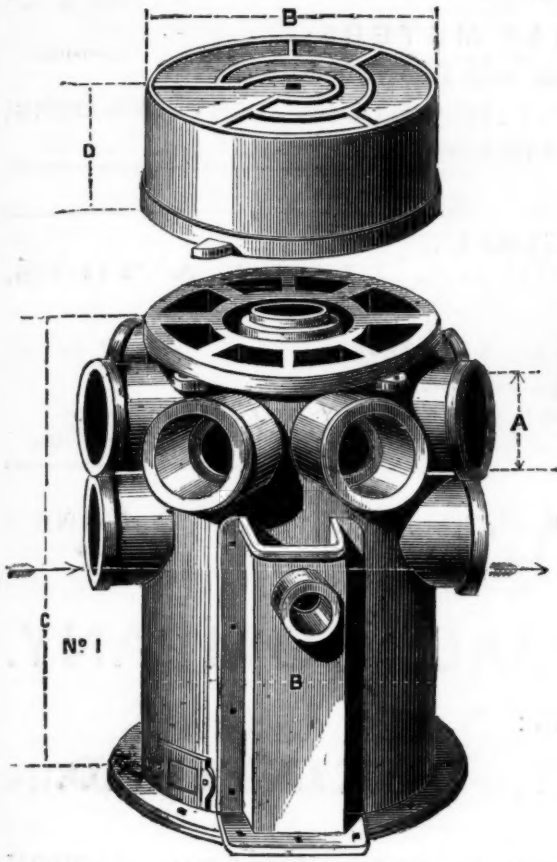
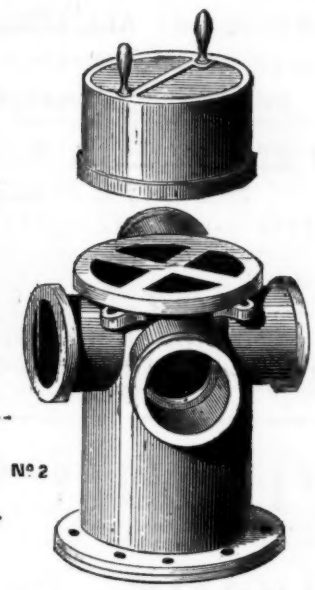
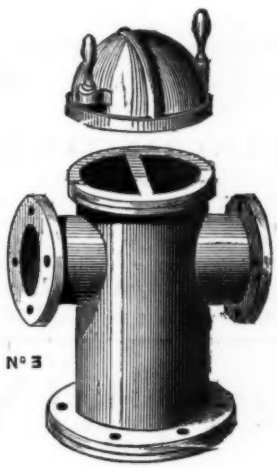
IMPROVED CENTRE-VALVES.







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Sizes of the THORNCLIFFE IMPROVED CENTRE-VALVE.

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A. Bore of Pipe. . .	4 ..	5 ..	6 ..	7 ..	8 ..	9 ..	10 ..	12
B. Diameter of Body.	16 ..	20 ..	23 ..	26 ..	28 ..	31 ..	34 ..	40
C. Height of Tank .	33 ..	35 ..	38 ..	43 ..	46 ..	48 ..	51 ..	56
D. Depth of Cover .	8 ..	9 ..	10 ..	11 ..	12 ..	13 ..	14 ..	16
Total Height . .	44 ..	44 ..	48 ..	54 ..	58 ..	61 ..	65 ..	72

In all cases the Covers are cast heavy enough to resist any required pressure.

The advantages derived from the adoption of these Valves are so manifest and cardinal that in the immediate character of the change—the simplicity of the machine—the facility affording for cleaning out connexions between Valve and Purifier—the perfect collection and delivery by suitable overflow of the ammonia, at a greatly diminished depth from ground-line over the old form of Valve—the advantage of connecting on the same level, and at any angle, or opposite to each other, the inlet and outlet pipes without dip or rise—the clear acquisition of space in the purifying-house, by being able to place the boxes nearer together, the new Valve being entirely under the floor—and lastly, though of the greatest importance, the passage of crude and unpurified gas during the change is minimized to the merest fraction, thus preventing the fouling by impure gas the delicate machinery and easily affected exposed movements of the station-meter, thereby preventing the introduction of the enemy (unpurified gas) into the gasholder. Also a dead abutment is offered to all back pressure, imparting thereby to the gauges, governors, and hydraulic seals, a steadiness of action never realized with the once famous, but now fast becoming obsolete, Hydraulic Centre-Valve.

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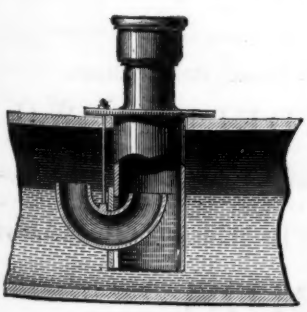
PURIFIERS, CONDENSERS, SCRUBBERS, GASHOLDERS, ROOFS,

And every description of Gas Machinery.

TENDERS GIVEN FOR WORK FIXED COMPLETE IN ANY PART OF THE KINGDOM.



Messrs. N. C. & Co. are also the Sole Agents for

HAWKINS' PATENT SELF-ACTING DIP-PIPES.

These Patent Self-Acting Dip-Pipes are rapidly coming into general use by gas companies. By their use the whole of the pressure caused by the old kind of Dip-Pipes is entirely removed, therefore the yield of gas per ton of coal is considerably increased. They also act as a perfect safeguard against the deposit of carbon (or scurf) inside the retorts.

A saving of fuel is effected, and the wear and tear to the retorts greatly diminished.

They are also perfectly Self-Acting, they being regulated solely by the gas. They cannot get out of repair, and when once fixed, will last as long as the old kind, and can be easily adjusted should the hydraulic main sink; they can also be worked with advantage where there is no exhauster.

Testimonials can be had from Herbert Unwin, Esq., engineer of the Sheffield United Gaslight Company and the Penistone Gas Company. At both these companies works they have been in constant operation for several months. Further testimonials can be had on application to the Patentee, J. G. Hawkins, Effingham Street Gas-Works, Sheffield.

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Including Chandeliers, Pendants, Hall Lamps, Brackets, Star and Sun Lights of all designs.

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Combining most recent improvements in principle and manufacture; upwards of 200,000 already in work, giving highest satisfaction.
(A guarantee of five years given with every Meter.)

PLUMBERS WORK, including Lift and Force Pumps; Cocks for Gas and Water and Steam; Brass Fittings.

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FOR PURIFIERS AND SCRUBBERS,

AND

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WITH

HOLMAN'S PATENT ECCENTRIC FASTENINGS.

OVER 7000 IN USE.

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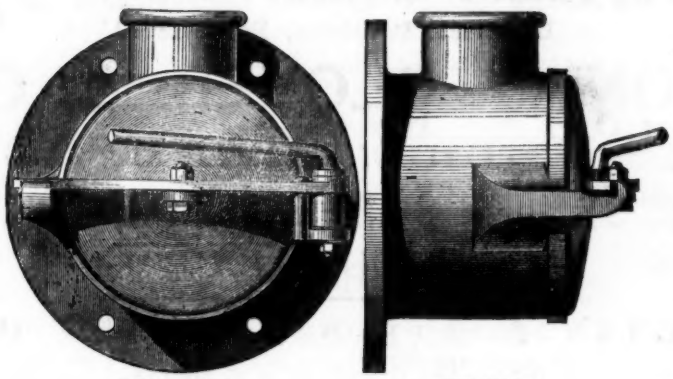
LIDS HINGED TO MOUTHPIECES; NO LIFTING ON OR OFF.

NO SCREWS FOR FASTENING.



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SIMPLE.

ECONOMICAL.

DURABLE

EFFECTIVE.

NO DUPLICATE LIDS REQUIRED.

These Lids are proved by many eminent Gas Engineers to be the most efficient, saving much time, labour, and expense; are opened and closed as quickly and with as little trouble as an ordinary furnace door, and by their use the Retorts are soundly sealed during the whole period of carbonization.

THESE LIDS ARE ADOPTED BY THE FOLLOWING (AMONG MANY OTHER) GAS COMPANIES:—

The Gaslight Company, Beckton (where over 2000 are in use).
,, Gaslight Company, Bow Common.
,, London Gaslight Company.
,, Independent Gaslight Company.
,, Phœnix Gaslight Company.
,, South Metropolitan Gaslight Company.
,, West Ham Gas Company.
,, Imperial Gaslight Company.

The Gas-Works, Royal Arsenal, Woolwich.
,, Alliance and Dublin Gas-Works.
,, Edinburgh Gas-Works.
,, Manchester Corporation Gas-Works.
,, Salford Corporation Gas-Works.
,, Rochdale Corporation Gas-Works.
,, Liverpool United Gas-Works.
,, Birkenhead Gas-Works.
,, Birmingham Gas-Works.

The Nottingham Gas-Works.
,, Newcastle-on-Tyne Gas-Works.
,, Carmarthen Gas-Works.
,, Merthyr Tydfil Gas-Works.
,, Ystrad Gas-Works.
,, St. Alban's Gas-Works.
,, Over Darwen Gas-Works.
,, Aylesbury Gas-Works.
,, Cardiff Gas-Works.

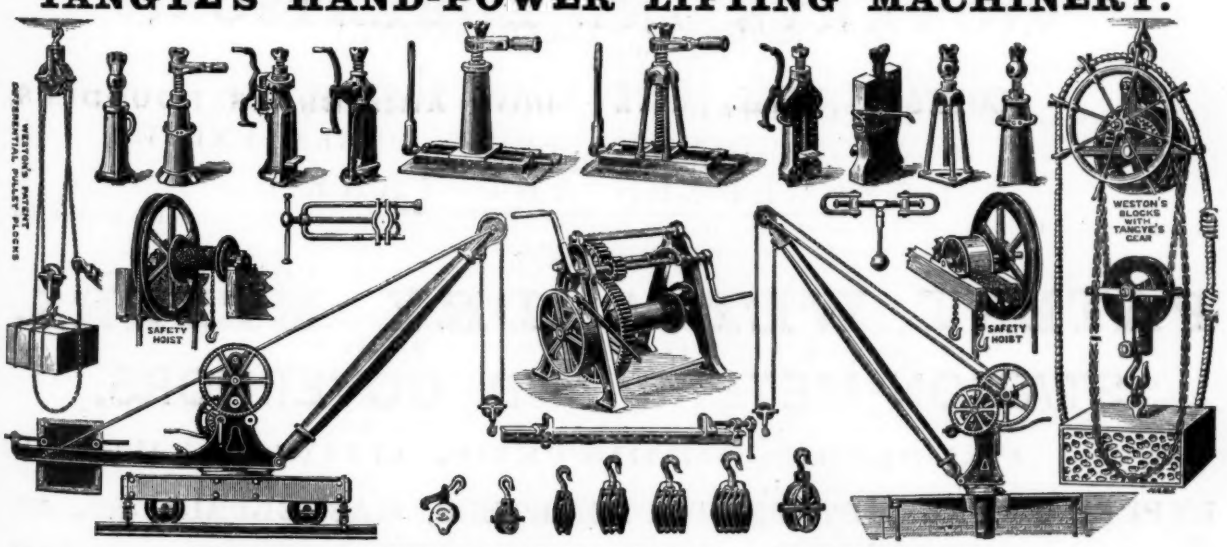
The Morton's Lid is made circular in form, that being the most convenient and suitable shape. It can be used for Retorts of any section, by adapting the Mouthpiece casting from the D, oval, or other shape, at the back, to circular in front.

The following important Testimonial, among others, has been given:—

The Gaslight and Coke Company. Engineer's Office, 6, Westminster Chambers, Nov. 14, 1871.

Dear Sir,—In reply to your inquiry, I have the pleasure of stating that the whole of the Mouthpieces at Beckton have Morton's Lids attached to them, and they have given us every satisfaction. We have 2160 in use.—I remain, yours truly, (Signed) F. J. Evans.

TANGYE'S HAND-POWER LIFTING MACHINERY.



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Paris, 1867.

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THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, SEPTEMBER 9, 1873.

Notes upon Passing Events.

ATTENTION has recently been called to the condition of dustbins—the receptacles for the refuse of every town householder, in reality what the dungheap is in a country cottage—as the fertile source of divers zymotic diseases. The complaint is that dust contractors do not perform their contracts in duly clearing the contents, and that vestries show an over-tender feeling for the contractors by not duly fining them for the breach. But there is another point in this question of dust collection that has not received the notice it deserves. What ought a dustbin to be? Sometimes it is a sort of brick vault, with a wooden lid more or less decayed, constructed so as to be as difficult of access as possible. More frequently it is a tub, a barrel, or a bin overflowing with foul refuse. If the inspectors of nuisances, instead of only coming when they are called, were to make periodical visits to respectable houses, and if it was their business to suggest the proper form of dustbins for houses about to be built, and to find fault, where there is good reason, with inefficient substitutes, then we should hear of less typhus and scarlet fever in genteel suburbs. The *Builder* has been giving, under the form of the story of Mr. Cheapside, the retired tradesman's, villa, a not overcharged description of a class of cheap, nasty houses that help to breed fevers in naturally healthy districts. Next to imperfect drains and sewers, a collection of festering garbage, in a so-called dustbin, is one of the most fertile sources of fever. Ignorant prejudice is not confined to the uneducated classes. The other day we came across an extensive piece of sewer-making in a picturesque road lined with trees and detached villas, inhabited by well-to-do people, in one of the most healthy suburbs of London—not newly built, but dating back some 30 or 40 years. All these houses, standing on an easy slope, drained the contents of water-closets into cesspits. A main sewer, constructed by the Metropolitan Board, ran within a furlong of the road, but not one of the inhabitants of villas, at rents ranging from £60 to £100 a year, had stirred to form a communication until scarlet fever had swept away every child in one house.

A gardening newspaper has been noticing the false principles on which the flower-beds of the London parks are decorated. The bedding-out plants make a very magnificent display for a very short period, at a cost that would be considered wastefully extravagant if any one took the trouble to ascertain what it was. At the close of every autumn the farce is gone through of distributing geraniums, fuchsias, and other plants of the same character to the poorer inhabitants of the district, to whom they could only be of use if they were also provided with heated conservatories for winter use. A writer in the *Gardeners' Magazine*, a thorough master of the subject, has contested the propriety of this expensive system, which, however well calculated for Italian gardens and setting off trim lawns, does not produce in great open spaces, like the parks, a result equal to the cost:—

> The herbaceous border is peculiarly strong in first-class flowering plants that display their beauties in the spring and summer seasons. But it does not follow that there is nothing left. We should be, at this moment, enjoying the rich and various colours of gladioli, tritomas, agapanthuses, gaillardias, hollyhocks, helianthemums, phloxes, rudbeckias, auratum, lancifolium, and tiger lilies, inulas, monardas, and the hardy autumn-flowering amaryllis. We forbear to raise any broad question as to the claims of hollyhocks, lilies, agapanthuses, gladioli, phloxes, and tritomas to spirited representation in the London parks. A number of truly magnificent plants not well adapted for private London gardens might be superbly grown in the public London parks. Take, for example, a plant just named, monarda didyma. It is a coarse and ragged thing in a small garden, but plant a dozen or more in a clump in a broad border adjoining an ample space of grass, with shrubs in the rear, and what a glorious blaze of rich deep ruby colour would follow! So, again, many other fine plants that are too coarse in character for close inspection might be turned to wonderful account in our parks, as, for example, the greater asclepiads, with their fragrant flowers and pods of seeds, the giant grasses, the glorious clematises, the quiet but truly beautiful funkias, and, not least of all, the perennial asters, with their wealth of white and blue and lilac flowers.

The Camberwell Vestry have had occasion to interfere with the tramways of that parish, and contemplate substituting one line for a double line in a narrow street. On the strength of this, an outcry against tramways is renewed, and a Superintendent of Police has gone out of the way to report against a system that he has found inconvenient to his Whitechapel cart; as if a policeman was a superior authority on such a subject. It is quite certain that if a roadway is allowed to fall out of repair, tramways become a danger to all other carriages crossing them. But, then, they ought not to be allowed to fall out of repair. The Local Boards of Works have ample powers, and are bound to exercise them for the benefit of the public. Any road, whether ordinary, tram, or rail, becomes dangerous when not kept in order. We are glad to find the chairman of the North London Railway complaining of the competition of the tramways, because it is competition of the most wholesome kind, by which the public must benefit.

A corrrespondent of a daily paper has described the demand for national schoolmistresses, their independent position, frequent holidays, and good pay, as compared with governesses. One reason why national schoolmistresses are scarce is that they marry off so quickly. But it is much easier to become a governess than a national schoolmistress. The latter must, after study, pass an examination, showing that she is competent to teach, and she gets promotion from smaller to greater schools, after having proved

her success in discipline and management. The former trusts to her personal appearance, the recommendation of friends, and paid agents. As the majority of the parents who employ cheap governesses know little or nothing, a few nominal accomplishments suffice. Governesses who really know their business get very high salaries, and have a good deal of their own way. It is the various charitable institutions which undertake the preparation of orphans and destitute girls for getting their own living, which ought and yet do not give their pupils the thorough training required in a national schoolmistress. As for the opportunities of marriage, the national schoolmistress has many, because the clerk of the parish, the head gardener of the squire, the butcher, the baker, and many commercial travellers, are happy to get an educated wife who sings in church and is accustomed to children. There is a special demand for national schoolmistresses as wives amongst widowers for these reasons; governesses, on the other hand, are not approached by, even if they would accept, the butler or the village tradesman. Mr. John Stuart Mill, by his will, under certain contingencies, which have not taken place, bequeathed £3000 to any university in Great Britain or Ireland that should first open its degrees to women, and a further sum of the same amount to found scholarships for female students. At present it is sufficiently difficult to find a woman capable of teaching her own and one other European language; if to this she adds the talent of carrying out discipline, she has a safe future in keeping a school, if she can find a partner equal to the housekeeping department. We hope that every impediment in the way of women acquiring the higher branches of education, and studying the science of medicine, may be removed. When it has been done, it will be found that those who are competent to learn are very few, that those who are equal to honourable distinction are very rare indeed, and that the majority of these will be lost immediately in the ruck of married women. The fact is that most of the young women who are discontented with their present social position want some employment which shall be refined, genteel, and well paid. They are not prepared to work their way up from the lower rungs of life's ladder; they desire to start from the top—as, for instance, a full-blown M.D., with a brougham, and a page to open the door. If colleges for women produce a class of superior teachers, who will thoroughly instruct the rising generation of young ladies—now so superficially educated that, beyond music, deportment, and handwriting, the majority know nothing—an immense step in advance will be made.

It seems that the boys caught up dirty, rough, and uneducated out of the streets and put through the training ships are turning out capital sailors, and that the captain of the *Swiftsure*, now doing his difficult duty off Carthagena, has a crew chiefly composed of these ex-street Arabs. The question has been asked why this system should not be carried a good deal further, and all destitute and abandoned children drafted into pauper schools and training ships should not be prepared for the army or navy, when found physically capable. It would be necessary to pass them through the navy first, because there is no place for boy soldiers, except as musicians, and to keep training schools of soldiers until they were 18 years old would be very expensive; but before such use can be made of pauper schools, public opinion, of the vestry class, will require education. Not long since, the majority of a metropolitan vestry sustained the religious scruples of the mother of a boy trained in a poor-house school, and eligible as a musician in a military band. The mother declared that she adhered to the principles of the Peace Society. It afterwards turned out that she expected to make more of her child's talents as a performer in public-houses. It must be definitively settled that where a boy has been educated at public expense, the State has a right to the first refusal of his services by land or sea.

The inhabitants of Richmond are complaining of the condition of the Thames, not without reason. Unfortunately, or fortunately, the engineers called in by the Richmond Vestry and by the Conservators of the Thames, agreeing on the grievance, differ entirely as to the remedy. The Thames Conservators engineers wish to dredge out and deepen the channel of the river. The Richmond engineer, Mr. Abernethy, proposes to keep out the tidal flow by a new lock:

"The object we seek to obtain," he asserts, "is the substitution of a volume of pure water in place of the present polluted stream, and this object cannot be attained by deepening the bed of the river as proposed, and the consequent admission of a greater volume of tidal water up to Teddington." He thinks the construction of a weir and lock the only proper remedy for the evil complained of. The conservators object that such a work "would exclude a very large quantity of tidal water which at present exercises a most beneficial effect on the river below by the scour which it produces," and that "a most serious silting up of the river would ensue." Mr. Abernethy sees no force in either of these objections. The amount of tidal flow arrested would not, he thinks, be sufficient to affect injuriously the navigation below London Bridge, and silting might be avoided to a considerable extent by proper arrangements. In a statement just issued the Richmond Vestry assert that on Aug. 4 "all the river steamers assumed to float in 16 inches of water grounded between Richmond and Teddington, had to discharge their passengers into small boats in mid-channel, and had to remain aground from ten o'clock a.m. until ten o'clock p.m; in short, until the return of the tide."

"Aquarius" writes to point out that a new lock at Richmond would soon create a reason for one at Putney, and so on, and maintains that deep dredging is the true remedy to balance the narrowed channel created by the Thames Embankment.

The movement for presenting a testimonial to Mr. Henry Cole, C.B., is evidently not a success. The chairman, the Marquis of Westminster, has well-deserved influence, but the rest of the committee contained so many names of past and present members of the council of the Society of Arts, that the weakness of the attempt was at once evident. Yet Mr. Cole has this very year rendered a substantial and much-needed service to his country by the school at the Exhibition, where the art of cooking common food is taught—a movement that, if successfully imitated in great towns and villages, will add 10 per cent. to the wages of working men, and relieve the traveller in England from the perpetual and disgusting monotony of steaks (generally tough) and chops (often greasy), with the occasional variation of eggs and bacon. What a blessing if the roadside taverns of Wales and the Highlands of Scotland, frequented by pedestrians and one-horse car travellers, should in future present some such savoury and inexpensive dishes as the little taverns of France and Belgium afford. Then from Staffordshire may come plates and dishes with the legend—"Thank Henry Cole for this," and a penny testimonial will come to a substantial sum. But however well the King of South Kensington may have deserved of his country, it is difficult to find subscribers for a man who has just been pensioned on his full salary, and started afresh on a new appointment at £1000 a year with perquisites.

The escape of Prince Arthur from drowning has called temporary attention to expedients for protecting bathers and swimmers from accidents. The most obvious is a man on watch in a swift unsinkable canoe provided with small life-buoys, a pole with an india-rubber ball at one end and many loops; on shore there should be life lines which can be shot by a cross-bow, which can be attached either to a float or to a man wearing some kind of life-belt, the best of which encircle the throat. Swimmers, however skilful, when they venture into rough water, should not disdain to use the lately-invented mackintosh air collars, which take up little room in the pocket, can be inflated in a few minutes, and worn round the neck without impeding any swimming feat except diving.

The Autumn Manœuvres seem to have developed some clever contrivances for cooking in the field. The military correspondent of the *Observer* calls attention to

The admirable contrivance of Armourer-Sergeant Warry, of the 42nd Regiment, which is used by some of the volunteers here in camp. It consists of a series of square camp kettles, fitting into each other like a nest of boxes, which, being piled round an iron frame with telescopic flue, form a capital boiler—the fire being made beneath—in which rations can be well prepared with less than half the regulation allowance of wood, and without the labour of trench-kitchen making. The Life Guards, the 7th Dragoon Guards, and some other regiments in camp, have a species of thin sheet iron kitchener in use, the invention of White, of Aldershot, which collapses for transport like a house of cards, and when in operation fulfils every culinary requirement of gentlemen who are not satisfied unless they mess as luxurious in the field as at their clubs

Permissive Bill advocates have done so much harm to the cause of rational temperance, that it is pleasant to find one common-sense practical leader of the opponents of drunkenness in a woman. A Miss Robinson, backed by the Temperance League, has been making an experiment on Dartmoor, and proposes to repeat it on Cannock Chase:

With the sanction of the military authorities they opened a temperance commissariat for the benefit of the soldiers, and have worked it so well as to make up to some extent for the deficiencies of the Control Department. Commencing at five o'clock in the morning, they have all day long supplied hot coffee and tea, in addition to most things eatable and drinkable which savour not of alcohol. In other respects the "Temperance Camp" has offered far better accommodation to the soldiers than the ordinary canteen, the men being able not only to obtain stationery and stamps, but having a tent placed at their disposal for recreation, reading, and writing. The "camp" appears to have supplied about 100 gallons of coffee and four gallons of tea a day in 1d. cups, and at certain hours of the day the demands upon its resources have been very severe. Miss Robinson is assisted by an earnest and competent staff; officers and men alike have largely and thankfully availed themselves of the advantages which it conferred. Miss Robinson has rushed in where the postal officials feared to tread, and has earned the gratitude of many a soldier's wife by sending to Plymouth for post-office orders for the men, neither the camp postmaster nor the Postmaster-General, though memorialized on the subject, caring to make the necessary arrangements. Writing to the secretary of the league on the 14th of August, Miss Robinson says that on the previous Saturday she had sent in for 40 orders, amounting to over £25, and adds, "Last year the soldiers wives left behind in garrison suffered much from being unable to get remittances from their husbands, and the men as a rule take no money back, saying they may as well spend it as lose it."

As our next Parliament promises to be largely recruited by silent supporters of the unlimited consumption of beer and gin—for brewers and gin distillers seem to come, see, and conquer at every election—it is well that some better arguments in favour of limiting public-house facilities should be provided than platform declamation. Miss Robinson is collecting evidence that the spouting of publicans cannot drown.

Now that the American forgers are sentenced to penal servitude for life, the usual reaction has set in on the merciful side, and a murmur has been raised that these accomplished swindlers have been too hardly dealt with. Certainly, if swindling deserves a severe sentence, this is not a case for mercy. Educated men with capital setting out to execute a deliberate plan of plunder are a variation of the organized bands of freebooters who existed in the middle ages, or the pirates who flourished still later. Neither met with the treatment accorded to prisoners of war. If the American forgers had succeeded in even a temporary escape, the whole system of foreign bills of exchange would have received a most damaging blow, for there are plenty of the same class in America who would have been encouraged to make a second attempt. One question in respect to this fraud so ably planned, has not been anywhere answered that we are aware of. Who were the capitalists who found the first funds? Who—to use a Turf phrase—backed Messrs. Bidwells and Macdonnell? It seems that they had previously defrauded private firms of sums so large, by means of forged bills, that the banks dared not raise a *hue and cry* for fear of damaging their own credit. It is very fortunate for the commercial world that there was a Bank of England to prosecute. The last fraud on the same scale—but less successful, thanks to *The Times* newspaper—led to the celebrated action of *Bogle v. Walter*, when there was a verdict for the plaintiff with a farthing damages.

The advocates for the abolition of the punishment of death would find something to learn in Italy. There the brigand assassins keep

the peasantry, amongst whom they live, in excellent order; for the peasants know that if they betray their robber tyrants to the police, the chances are that the murderers will be found guilty with extenuating circumstances, or be acquitted, or, in any case, escape and return to poniard their accusers. Safety is, therefore, on the side of the brigands, to whom murder is a useful crime—it silences one witness and frightens the survivors. When the punishment of death is abolished, every burglar and every ravisher will find it safest to destroy the evidence of his victim, for he will balance the protection from detection against a few years more or less of penal servitude.

Professor Tyndall, in his recent republication of his "Six Lectures on Light, Delivered in America," has made some remarks on the manner in which certain persons trade in science, and make jobs for providing for very superficial persons who pertinaciously pursue the governing power. On this a contemporary justly remarks:

The British Association will meet shortly. Appeals have been made, and are to be made, to the Government and to the nation for assistance to scientific investigation; but, instead of being made in the interests of science, such appeals have been, and will still be, made with sole reference to the interests of a few adventurers. It is melancholy that this should be the case, that men of the highest eminence should have to withdraw from schemes to which, while as yet their real object was concealed, they gladly gave support. But, as Tyndall well remarks, "there are things better even than science. Character is higher than intellect. What," he asks, speaking of the men who have bequeathed the vast body of knowledge sketched in his lectures, "what was the motive that spurred them on? what urged them to those battles and those victories over reticent Nature which have become the heritage of the human race? It is never to be forgotten that not one of those great investigators, from Aristotle down to Stokes and Kirchoff, had any practical end in view, according to the ordinary definition of the word 'practical.' They did not propose to themselves money as an end, and knowledge as a means of obtaining it. For the most part they nobly reversed this process, made knowledge their end, and such money as they possessed the means of obtaining it." Precisely when the true men of science of this country were preparing to make just and proper claims, asking only that "this glorious plant should have the freedom, light, and warmth necessary for its development," the claims of science are rendered ridiculous, and something more, by the enunciation of schemes manifestly intended to advance the personal interests of their devisers. If A and B and C, who have been engaged in observations relating to the subjects X and Y and Z, come before Government (or try to cause societies to which they belong to come before Government) with the request that a new post of emolument be founded for the study of X, a new Government observatory for Y, or a costly laboratory for Z (with salaries in all cases to correspond), what can the disinterested followers of science do but remain silent and ashamed? This is what has happened, is happening, and will continue to happen, unless all such unworthy manœuvres be at once and resolutely resisted.

In a letter to *The Times*, Mr. Baynes has published some tables which exhibit in a very remarkable manner the growth of the railway system all over the civilized world—his object being specially to call attention to the requirements of India. With that part of the subject we do not propose to deal. We are content with calling attention to the results of much-attacked private enterprise in this country, as compared with continental states, where Government works or regulates both construction and traffic:

Year.	Miles Open.	Capital Paid.	Gross Receipts.	Annual Value of Exports and Imports.
1841	—	—	—	£116,058,891
1851	6,890	£248,240,897	£14,997,459	185,127,897
1861	10,865	362,327,338	28,565,355	377,117,522
1871	15,376	552,680,107	48,892,780	614,590,180

The relation between the extension of the railway system and the growing commercial prosperity of the country is sufficiently obvious from the foregoing figures.

I will test the extent of the system by showing its relation to the population and area of the United Kingdom. The figures of this comparison are given below for the open mileage as it stood at the end of 1872, as also for some of the European countries, the United States of America, and India:—

	Population.	Area in Square Miles.	Population per Square Mile.	Miles of Rail.	Per Mile of Rail. Population.	Per Mile of Rail. Square Miles.
Great Britain and Ireland	31,817,108	120,879	263	15,814	2,012	7·7
England and Wales	22,704,108	58,320	389	11,136	2,039	5·2
Scotland	3,358,618	30,685	109	2,587	1,298	12
Ireland	5,402,759	31,874	169	2,091	2,583	15
India	236,523,542	1,617,388	146	5,372	44,036	301
France	36,469,875	201,900	181	10,610	3,437	19
Belgium	5,087,105	11,412	451	1,892	2,689	6
Germany	41,058,139	212,091	193	10,916	3,761	19·4
United States (inc. Alaska)	38,558,371	3,603,844	107	60,382	638	59·6

The only country that shows equal vigour is America, where, in ten years, nearly thirty thousand miles had been added to the railway system. But in America, where all political influence is in the hands of wealthy, energetic men of business—uncontrolled either by the representative institutions, which they purchase and command, or by a public opinion of gentlemen, which does not exist in that commonwealth — the railway companies do as they please, and are the masters of their customers.

The traffic receipts on the railways in the United Kingdom for the year 1872 amounted to £53,235,510, or £3366 per open mile, of which the sum of £29,016,559, or £1835 per open mile, was for goods and minerals. The number of passengers carried was 422,874,822, or 26,741 per mile, of whom three-fourths were third-class. The number of tons of merchandise and minerals conveyed was 179,302,121, or 11,388 per open mile. The train-mile rate of receipt was 5·58s. The increase in these figures over 1866 (or six years ago) is 1960 open miles, 148,581,154 passengers, and £13,139,760 in traffic receipts.

For 1873 the passenger traffic has been considerably increased by third-class passengers. If the railway companies, by some timely concession, are able to justify Mr. Gladstone, or whoever may be the Chancellor of the Exchequer when Parliament considers the Budget of 1874, in repealing the passenger duty, we may anticipate a further reduction of fares and increase of passenger traffic. Looking at this gross sum of fifty-three millions and a quarter, more than half of which is derived from goods and minerals, we again ask to which of the present or future Cabinet Ministers the management of this work could safely be entrusted? We can understand Mr. Scudamore, or the Messrs. Hill, of the Post-Office, contemplating the conversion of every station-master and every traffic manager into a Government officer; a correspondence with a series of departments whenever a claim for a damaged crate of eggs was sent in, and the final award of my Lords of the Treasury. But very few out of official life, except those barristers of five years standing who are eligible for every appointment, would like to see the system of the Inland Revenue applied to our railway management.

The two rival underground railways have both schemes for connecting and completing the inner circle, and forming an eastern connexion with the outer circle—the North London. Both ask assistance from the Metropolitan Board. The Board wisely requests the rivals to come to an understanding, and propose one combined plan. Eventually these companies must amalgamate; at present they are fighting for terms. In what other city of the world has private enterprise provided such public advantages as the underground railways afford, and will afford when the Herculean work, the Eastern District—uniting both sides of the Thames, passing under the river and the docks—and the two circles, inner and outer, are united and completed?

The committee of the House of Commons on slaughter-houses was surprised to find that there were 1300 private slaughter-houses, besides nine at the Metropolitan Market, 28 at the Deptford Cattle Market, and 30 in the City of London. They had two plans before them. The one was founded on the wild notion that the metropolis could eventually be entirely fed by meat slaughtered in the country. Some patent railway trucks were to entirely protect the carcases sent in summer from the putrefaction that, according to unanswerable evidence, is now inevitable. The other was a large building job: £200,000—which, according to all precedents, would have swelled into £1,000,000—was to be expended in ten slaughter-houses, or as many more as might be needed, to be managed by the Market Committees of the City of London or the Metropolitan Board. The evidence brought before the committee satisfied them that much would be lost and nothing gained by abolishing *well-built, well-drained, and duly-inspected slaughter-houses*. Of the necessity of impermeable walls and floors, ample water supply, good arrangements for the division and preparation of foul and eatable offal, there was no question. The report of the committee against turning slaughter-houses into public institutions, and in favour of retaining all the well-managed slaughter-houses, was unanimous.

Circular to Gas Companies.

To complete our abstract of the accounts of the metropolitan gas companies, we give below a statement of the quantities of gas sold by meter, by the several companies, per ton of coal carbonized. They are as follows:—

Ratcliff	8446 cubic feet.
South Metropolitan	7921 "
London	7911 "
Commercial	7890 "
Imperial	7872 "
Independent	7400 "
Chartered	7241 "
Phœnix	7153 "
Surrey Consumers	6702 "

These are, as we have said, the quantities sold by meter. To arrive at the gross sale we have to take into account the amounts received for public lamps and sales under contract, and when this has been done some alteration must be made in the relative position of two or three companies in the list. As it stands above, an injustice is done to the Surrey Consumers Company. Theirs is an altogether exceptional case. The amount of money received for sales under contract, &c., is in their instance just about one-fifth of the sum received for sales by meter. In no other company is it more than one-seventh, and in the case of the Chartered it falls to about one-thirteenth. It follows, therefore, that the last-named company really stands in the worst position as regards the total sale of gas per ton of coal, and the Surrey Consumers and Phœnix will stand next. The loss of gas in all these three cases must be considered excessive if the usual quantity is produced per ton.

The answer of the directors of the Dublin and Alliance Gas Company to the committee of shareholders, who have assured themselves that if the works were in good order, and the affairs of the company properly managed, a 10 per cent. dividend could be easily earned, with gas at the present price and quality, has been a notice of application to the Board of Trade for authority to raise the price or lower the illuminating power of the gas, a very clear intimation that the directors are not of the same opinion as the committee. The notice has, of course, attracted the attention of the Corporation of Dublin, who have determined on offering the most strenuous opposition to the granting of the order. There will be no doubt a long and costly inquiry, with what result we shall not venture to prophesy. One thing would seem certain—viz., that the undertaking cannot long be kept out of the hands of the Corporation, and this application will probably hasten the transfer. That the application should be thought necessary is greatly to be regretted, for if the order be not granted, or indeed if it be, it must have the effect of depreciating the value of the undertaking. If any alteration be made by the Board of Trade, we hope it will be in the way of a reduction of illuminating power; 14 or 16-candle gas is good enough for any place or any purpose. We do not suppose that any one in Dublin but the officials concerned

have ever observed any difference in the light given by the gas now supplied, and that supplied two years ago, unless it be the inveterate grumblers, who insist that the light is nothing like so good as it used to be.

Whilst writing of Irish affairs, we may mention that a dispute between the Drogheda Corporation and gas company, as to the terms on which the public lamps should be supplied, has resulted in the use of oil lamps for lighting the town. The account of the circumstances which has reached us, if correct, we are bound to say does not reflect much credit on the company. The offer of the council to take the gas at the same price paid by private consumers, provided they were allowed the discount the company allow to large consumers, seems to us a fair one, while withholding any reply until the very day the previous contract expired appears to us an unfair way of compelling the council to accede to the terms demanded.

The Gas Committee of the Corporation of Glasgow have, we understand, unanimously agreed to recommend the council to raise the price of gas from 4s. to 4s. 7d. per 1000, and it is added that unless there be a speedy and considerable reduction in the price of coal it will be necessary for the council to apply to the Board of Trade for power to raise the price still further. The profits made by the Corporation last year are nothing like sufficient to pay the annuitants and interest on borrowed capital, and the increase of price now proposed will certainly not, under the most favourable circumstances to be expected, bring them up to the amount which will be required in the present financial year. So vanish the hopes of saving rates by the profits of gas-making. It may be expected that the present unfortunate condition of our industry will have the effect of allaying the passion for the acquisition of gas undertakings by local authorities which has been so strongly exhibited in the last few years.

Things do not look very hopeful in Hereford, where the profits of the first year during which the gas undertaking has been in the hands of the Corporation are insufficient to pay the interest on the money borrowed and the instalment of the purchase-money which is now due. The deficiency, however, is not great; but as it will probably increase in subsequent years, the question how it is to be met is already attracting attention. We are happy to see a Councillor having the courage to suggest that it might be more fairly met by a payment out of rates than by raising the price of gas. It has been often urged in these columns that a gas consumer is unfairly taxed when the profits of a corporate undertaking are applied in aid of rates, and he is no less unjustly treated when he is made to pay the whole of the purchase-money for an undertaking which eventually becomes the property of consumers and non-consumers in common. It is quite equitable that non-consumers should be made to contribute something by means of rates.

There is a sensible proverb which recommends people "never to "halloo until they are out of the wood." We are reminded of it when reading an article in a Ryde newspaper, headed, "Providential "Gas Escape." The writer refers to the last half year's accounts of the Ryde Gas Company, which show, he says, a profit of £660, and he goes on to calculate that the interest on the "price shamefully "awarded" would, for the same time, amount to £1500, and the sum required for the sinking-fund, £280; so that if the works were now in the hands of the Corporation, they would have sustained a loss of £1118 on the half year. He proceeds—"This statement shows that "if it had been possible to fix this incubus upon the shoulders of the "people, they would have been sufferers, reckoning at the same ratio, "to the enormous amount of £2236 per annum, and if the law "expenses are added, £2500 a year loss would not be overstating the "ruinous position we should have had to sustain." He evidently does not at all contemplate the probability that a court of law may presently decide that the Corporation shall pay the £70,000 now demanded and sued for by the company; but at all events until it has been decided the other way it is premature to congratulate the Corporation on a "Providential Gas Escape."

We fear the Corporation of Brighton have not been well advised in their dispute with the Brighton and Hove Gas Company. It seems to us that the first part of section 3 of the company's Act recently passed was drawn and framed expressly to give the company power to make an immediate charge of 4s. per 1000 to the Corporation. It is equally clear to us that section 9 requires a notice in writing from the Corporation before any change can be made in the quantity of gas to be consumed in the public lamps. If the Corporation had been up to the mark they would have given notice to change the burner, and reduce the consumption in each lamp to as near as possible 15,000 feet a year, on July 9, and then all would have been *en règle*. As it is, we expect the Corporation will have to pay the additional charge from July 8, and will learn to be more wide awake in future.

By a slip of the pen, which every reader must have corrected for himself, we in our last "Circular" represented the Governor of the Imperial Company to have said that the additional purification of the company's gas required by the referees would raise the cost to 10d. per 1000 feet. What was meant was, of course, 10d. per ton of coal. We refer to the matter again merely to point out that the present cost of purification to the Imperial is a trifle over 4d. per ton, while the cost to the Chartered, whose purification is satisfactory to the referees, is barely 5d.; and we see no reason why the cost in the case of the Imperial should be double that of the Chartered.

MALVERN LINK GAS COMPANY.—The half-yearly meeting was held on Monday, Sept. 1—Mr. A. Brown in the chair. The accounts presented were considered very satisfactory, and admitted of the payment of a 7 per cent. dividend, a small balance being carried over. The chairman congratulated the shareholders on having for their secretary a gentleman (Mr. W. Underwood) who was so well acquainted with the coal market.

Review.

SEWAGE UTILIZATION.*

To many people who desire information as to the different modes of utilizing sewage which have been proposed or are in actual practice, but who have no wish to wade through bulky Blue-books and innumerable reports, the compilation of Mr. Burke, the title of which will be found below, will be most acceptable. It has been very carefully prepared, and gives a short and fair account of the various processes with the alleged results. A lawyer-like style pervades the work, every statement being accompanied by a reference to the authority, so that any reader who wishes for details will know where to look for them. We notice one statement which we think must be a blunder, but it is probably the printers. It is said (p. 28) that *sulphate of ammonia* has been tried with partial success as a precipitant at Stroud, in Gloucestershire. The truth is, no doubt, what is stated on the next page, that *sulphate of alumina* has been employed at Stroud. As a rule, the author is not the advocate of any particular system, but, in a thoughtful introduction, he recommends the adoption of a combined system of precipitation and irrigation with the defecated water. This is the plan which finds most favour to-day, but there will be difficulties in the case of every large town. Very few agree as to the best precipitant to employ, and the quantity of land required for irrigation with the sewage of a populous town is a very serious matter. Sewage is still a difficulty, and will be, we fear, for many a year to come. If the author departs at all from the strict line of impartiality he laid down for himself, it is when he recommends the adoption of General Scott's process, a recommendation which might well have been deferred.

WHAT A HOUSE SHOULD BE.†

Many years ago Mr. Bardwell published a little work on "Healthy Homes, and How to Make Them." A number of cottages have been erected according to his plans, and, in a sanitary point of view, they have been a success. Having done so well for the poorer class, he has now taken the better classes under his wing, and in the book mentioned below, dedicated to the "Upper Ten," he tells us where to look for "Death in the House," and how to keep the fell Destroyer out. It will suffice to say that, as regards the sanitary arrangements of a house, the advice the author gives is in general sound and good. Mixed up with it, however, is a great deal of nonsense which will afford the reader more amusement than instruction. Take, for instance, his advice as to what to do in case of fire. "When any part of a house is discovered to be on fire, instantly send"—for the turncock and engines? No!—"to the nearest chemist for one pound of bicarbonate of soda and one pound of tartaric acid; put first one and then the other into five gallons of water in a *close* cask. The mixture produces carbonic acid, which extinguishes life as well as fire. Throw the mixture through a spout upon the flames, and the fire will be immediately mastered." That is, of course, if the flames have not made too much progress while the servant was gone to the chemist's and you are getting the barrel and measuring in the five gallons of water. But the author is not only an architect and sanitary engineer, he is also a financier, and recommends the Chancellor of the Exchequer to put a tax of 2s. per 1000 on gas! Nor does he confine his attention to these matters only. He has something to say on dress and diet, and speaks of the sanitary advantages of kilts for men and low dresses for ladies, and of the value of onions and water-cress to those who desire a family. The book is evidently the production of a well-meaning enthusiast, who, if he had confined himself to the subject-matter of his title, would have produced a much more useful, but certainly not so entertaining a work.

Correspondence.

CONDENSERS.

SIR,—In a description in your last issue of a condenser, under the heading "Graham's Horizontal Condenser," it is stated that "this arrangement was first proposed by Mr. Graham in the columns of the *Engineer* several years ago, and has since been adopted by several large companies," the inference being that these large companies have adopted Mr. Graham's idea.

Having used this form of condenser for several years, I am anxious to make it clear that I have not taken the idea of another consciously without giving him the credit; the fact being that, not reading the *Engineer*, I never saw the description, nor did I ever hear that Mr. Graham originated the idea.

Wherever I have had to erect, or to advise the erection of condensers, for the last six or seven years I have used and recommended this form, the only difference between mine and Mr. Graham's being that I use common bends, or U-shaped ones, at the ends instead of T's, and the pipes have no framing to support them, but are simply placed tier above tier, with iron or oak blocks between. One of these condensers has been four years in use at these works, and has kept perfectly clear. I am now erecting two others, using 24-inch pipes. I have also had them erected at North Shields and at Aldershot, where they have been several years in use, and in all cases the result has been highly satisfactory.

I do not claim the idea as my own, but look upon it as simply an extension of the plan of carrying a main round the retort-house; it is a more complete development of the principle of gradually cooling the gas in contact with the tar and liquor, and of not separating the latter until the whole have been brought down to the lowest temperature required, which system fully carried out not only increases the strength of the condenser liquor, but relieves the purifiers, by removing a considerable proportion of the carbonic acid and sulphuretted hydrogen, and reduces the tendency to deposit naphthaline in the mains and services.

GEORGE LIVESEY.

South Metropolitan Gaslight and Coke Company,
589, Old Kent Road, S.E., Aug. 29, 1873.

SANDERS'S PATENT FOR WATER GAS.

SIR,—As there are many new schemes for manufacturing gas attracting attention just now, the publication in your JOURNAL of the specification of a patent for water gas taken out by me for Ireland in the year 1835 may, perhaps, interest some of your readers.

At the time my patent was taken out separate patents were necessary for England, Ireland, and Scotland; and, as Irish patents were not noticed in the *Repertory*, or any similar periodical, I very much doubt if my specification was ever printed. I now enclose for your inspection and publication, if you will, the official copy which I recently procured at the Record Office in this city.

Your readers will be able to compare my specification with any other which may now be under discussion, and judge for themselves to what extent I may be entitled to claim priority of invention.

Some years since a *résumé* of patents for water gas was given in your

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* "A Handbook of Sewage Utilization." By Ulick Ralph Burke, M.A., Barrister-at-law. Second edition, revised and enlarged. London: E. and F. N. Spon. 1873.

† "What a House should be, *versus* Death in the House." A companion book to "Healthy Homes, and How to Make Them." Illustrated with drawings of sanitary dwellings and sanitary appliances. By William Bardwell, Architect and Sanitary Engineer. London: Published for the author by Dean and Son. 1873.

JOURNAL, and in a subsequent number it was conceded to me that I was the first to treat the manufacture of gas from water on just chemical principles.

6, Burlington Road, Dublin, Sept. 3, 1873. GILBERT SANDERS.

No. 84.—"Specification of Gilbert Sanders of his *Improvements in the manufacture of gas for the purposes of illumination.*" Dated March 8, 1835, and enrolled in the Office of the Rolls, March 30, 1835.

My invention consists in improvements in the process of manufacturing gas from water by converting all, or the greater part of the carbonic acid which is given off along with the other gases into carbonic oxide, and rendering all these inflammable gases fit for the purpose of illumination, by causing them to dissolve or take up and carry off the vapours of certain highly volatile and inflammable compounds of hydrogen and carbon in the manner hereinafter set forth. And I do declare that this purpose may be effected by and in the manner following, that is to say:—Cylinders or retorts of clay or iron are to be filled, or partially filled, with the finely divided charcoal of wood, of peat, or turf, or the coke of pit coal. These cylinders or retorts are to be set and heated in furnaces, after the manner of those employed in the manufacture of coal or oil gas. When these retorts are at a bright red heat, water, or the steam of water, is to be admitted at or near one end of the retort, where, coming into contact with the heated charcoal, it is wholly or in part decomposed, and passes out of the retort at or near the other end. By this means a portion of the water will become decomposed, and there will be produced hydrogen, sub-carburetted hydrogen, carbonic acid, and carbonic oxide gases, of which three—viz., hydrogen, sub-carburetted hydrogen, and carbonic oxide gases—are inflammable, and carbonic acid gas is not inflammable; but, to render this last gas inflammable, and likewise to decompose that portion of the water which has come off undecomposed, I cause the whole of the gases and the aqueous vapours to pass through a second retort immediately after leaving the first. The vapour and gases now pass out at the other end of this second retort, and may be made to pass through a third, and so on until the whole or nearly the whole of the water is converted, by means of the heated charcoal, into inflammable gases. The apparatus I use for this purpose is a series of two or more retorts connected by means of tubes in such a manner that the gases and vapour pass through one retort, then enter a second at one end and exit at the other end, and so through a third and fourth if thought necessary, which will much depend on the heat and the quantity of water or steam of water passed through, and which ought to be no more than the apparatus is capable of completely decomposing, and I recommend that the retorts be kept at a high temperature and well charged with charcoal; or instead of the apparatus above recommended, I use a retort having one or more longitudinal divisions, so arranged that after the gases and vapours have traversed the retort by one of its compartments they may return through another, my object in both these cases being to pass the gases and vapour over a large surface of the heated charcoal, as thereby the carbonic acid, which is formed during the decomposition of the water, is, by being combined with more carbon, resolved into double its volume of carbonic oxide and becomes inflammable. As it is not possible to produce these inflammable gases at all times free from contamination with carbonic acid, I pass them through moistened lime or the cream of lime in purifiers, such as are used to purify coal gas. But the gases so produced have little or no illuminating power, and are not yet fit for the purposes of illumination. To render them illuminative, I pass the hydrogen, sub-carburetted hydrogen, and carbonic oxide gases through one or more cylinders, or other vessel or vessels heated to redness, into which I introduce tar, coal tar, turpentine, rosin, oil of rosin, petroleum, asphaltum, bitumen, obtained naturally or artificially, naphtha, vegetable oils, animal oils, tallow, or caoutchouc or the volatile oils produced by the destructive distillation of any of the above-named substances. These substances or any of them, or their volatile oils or any of them, are to be introduced gradually into the sealed vessel or cylinder in proportion to the gas passed through, which gas combining with the vapours of certain highly volatile compounds of hydrogen and carbon then liberated, will take up and carry off the most volatile part of the same and become highly illuminative, but as there will also be given off from the above-named substances certain other compounds of hydrogen and carbon, which if carried into the mains and services would be deposited therein and obstruct the passage of the gas, I pass the gas so rendered illuminating through a condenser, such as is employed for coal gas, to condense and arrest the same. The before-mentioned gases may also be rendered illuminating by passing them through a closed box or other vessel containing the volatile oil obtained by the destructive distillation of a caoutchouc, coal tar, rosin, petroleum, bitumen, asphaltum, tallow, animal oils or vegetable oils, or naphtha, and to which vessel must be applied a steam or other heat sufficient to convert the most volatile parts into vapour. The gases will in this, as in the first case, unite with the most volatile compounds of hydrogen and carbon so liberated, and become illuminating. It is necessary to pass the gases and oily vapours through the condenser before mentioned to arrest and condense such parts of them as would condense in and stop the mains and services, but the method which I prefer is to procure, by distillation and careful rectification the most volatile part of coal tar of the volatile oil of oil or rosin gas manufactories of the volatile oil of caoutchouc, of the volatile oil obtained by the destructive distillation of certain animal, vegetable, and mineral substances which produce an oil by distillation and rectification, and which will boil under the temperature of 230° of Fahrenheit's thermometer. To obtain this most volatile part, I distil the rectified oils in a water bath; the addition of a small quantity of nitric acid of commerce, diluted with three or four times its bulk of water, greatly facilitates the distillation. If the acid be used, I wash the distilled oil with an alkali to separate any acid that might come over or be formed during the process. This oil or naphtha I enclose in a covered vessel or box, into which the gas is introduced by means of a tube for the better combination of the gases with the vapours of these highly volatile compounds of hydrogen and carbon. I use an apparatus similar to that represented in the margin. A is the pipe by which the gas is introduced into the closed vessel, C, C, C, C. The bottom of this pipe is stopped by a plate of metal which is perforated with a number of small holes, through which the gas issues into the box. Above this is a plate of metal, D, dividing the box horizontally. This plate is also perforated all over with small holes about the tenth of an inch in diameter, and through these holes the gas passes whilst rising to the surface of the fluid, E, when it passes off to the gas-holder or to the consumers by the outlet-pipe, B; my object in passing the gas through the small holes in the tube and the plate being to divide or break the gas into minute bubbles, to combine it more effectually with the oily vapours, and this might be effected also by filling the box with other bodies, such as straw, heath, or fragments of metal, &c. A gentle heat may also in this third case be applied to the liquid; but the condenser is not necessary, and the heat should not exceed 110° of Fahrenheit. I also declare that the above process or processes will also be applicable to imparting an illuminating power to the before-mentioned gases, viz.—hydrogen, sub-carburetted hydrogen, and carbonic oxide gases—whether they be obtained by other and well-known processes not here described. Although I have described the whole of the above process, and the apparatus by which it is effected, I do not claim an exclusive right to any part thereof, except the construction and arrangement by which the gases are made to pass over an extensive surface of charcoal or coke, and the arrangement by which the non-illuminating gases—viz., hydrogen, sub-carburetted hydrogen, and carbonic oxide—are combined with the highly volatile compounds of hydrogen and carbon, and thereby rendered illuminating.

PROPOSED APPLICATION BY THE PAISLEY CORPORATION TO THE BOARD OF TRADE.

SIR,—Will you be kind enough to correct a misstatement which appeared in the JOURNAL of the 26th ult., in reference to the intended application to the Board of Trade by the Town Council of Paisley for an advance on the price of gas? The reader is made to believe that the maximum price of 6s. per 1000 feet to be asked from the Board of Trade is at once to be charged to consumers, which is far from correct.

The price charged for 29-candle gas in Paisley during the past five years has been 3s. 9d. per 1000 feet, and at the transfer of the works to the corporation, in 1870, Parliament allowed a maximum of 4s. 2d.; but now that coals and wages have increased the cost of production to the extent of about 1s. 8d., and in order to allow a sufficient margin for probable future requirements, it is intended to ask a maximum of 6s. per 1000 feet. At the same time it is not intended (for the current year) to charge more than 5s. per 1000 feet, and at that price the corporation will be recouped the loss sustained by selling the gas at the present maximum of 4s. 2d. until an increase has been sanctioned by the Board of Trade (allowing the same be granted within a reasonable time); and, in addition to this, there will be provided the amount prescribed by the Act as a sinking-fund for the redemption of annuities.

GEO. R. HISLOP,
Paisley Gas-Works, Sept. 4. Engineer and Manager.

[The intention of the Act in the case of undertakings in the hands of local authorities is by no means clear; but we do not believe the Board of Trade will give to these bodies an elastic price, any more than they would to trading companies. We doubt also whether the Act of Parliament can be taken to have a retrospective effect, so as to justify an application to recoup past losses sustained by them.—ED. J. G. L.]

UNACCOUNTED-FOR GAS.

SIR,—Allow me to offer a few remarks upon "unaccounted-for gas." First, with reference to the quantity sold being "the crucial test." No doubt, all things being equal, it is a measure of commercial success, but, being affected by past management, it is little or no test of the present.

The application, too, of this test must press unjustly upon companies and managers in districts subjected to considerable disturbances. To expect as much gas sold per ton of coal carbonized in such places as in quiet towns with a good soil is to expect impossibilities.

Under such conditions, to "measure the value of the work by the number of cubic feet of gas they are able to produce from a ton of coal," is of great value; it allows of comparison to be made, and the condition of distributing plant to be tested. To discredit the value of the measurement of "gas made" is to sap the very foundation of good management. The efficiency of a new manager may be at once proved in this—the gas made—but not so in the distribution; for the former he is immediately responsible for its economy, but not so in the latter. There should, however, not be the least doubt about the accuracy of the meter, or the temperature of the gas; both should be in a normal condition. The value of measuring the gas in bulk as made is considerable, but not more so, I believe, than measuring it into each district would prove, as there would then be a continuous check upon the distribution, by comparison with the quantity sold as per consumers meters.

Mr. Good quotes from Mr. Anderson's remarks upon the paper on "Unaccounted-for Gas," thus: "A great deal of the talk about per centage of unaccounted-for gas is all bosh;" and as he then adds, "that before any engineer or manager goes to the trouble and expense of stripping his mains and services to search for gas that he never actually made, and therefore cannot have lost," the inference is that the whole subject is "bosh." But surely this is not the opinion of Mr. Anderson, with his good sound sense and great practical experience. He knows that a considerable quantity of the "unaccounted-for gas" is from leakage of mains and services, as well as that much of "the talk" is "all bosh."

Now, in most, at least, of what has been said and written upon the subject, there is nothing but of a general character—mere guesses, no facts. Some say look to your station-meter; others, to the consumers meters; some think it in the temperature, others in the pressures; some believe it is consumed in the public lamps, others that it never leaves the works, as it escapes from the holders; and as for mains and services, everybody has had considerable experience in these, and therefore is an authority upon every description of joint, materials, and manner of laying. Now, as I have had a portion of a very large district—*not* the work of the Shields Company—just subjected to a thorough examination, I beg to place before your readers the results.

Mains—3 inch	. . . .	860 yards.
4 "	. . . .	875 "
Total length	. .	1735 "

Services, No. of—Lead, 71; iron tubing, 10; total, 81.
Meters, No. of—Wet, 4; dry, 63; total, 67.
There are no public lamps.
Gas Sold—One year, 1,113,000 cubic feet.
The leakage upon the district at 3 inches pressure was, per hour, 50 feet.

Escapes from joints of mains	. . . . .	10 feet.
" " lead services	. . . .	28 "
" outside cocks or lead services	.	12 "
Total.	. . . .	50 " per hour.

Corrected to average pressure, through 24 hours of each day in the year, by experiment, 26·59452 feet per hour.

Loss per annum on mains and services	. .	232,968 cubic feet.
" " meters	. . . . .	73,837 "
Total loss	. . .	306,805 "

Loss per cent. on gas sold, 27·5656.

Now, as the company's loss is from 20 to 30 per cent., indeed, I believe, about 27 per cent., it is remarkable that this section of the work should so closely approach the whole. By these experiments I am confirmed in the opinion I have already expressed, that the "unaccounted-for gas may be reduced to so small a minimum as to be lost in condensation."

The meters are all of recent construction and of various makers; the mains are tolerably well laid, and in clay; the services, however, are bad, some of them being partly of compo pipe, the company having allowed the fitter to connect at outside cock on service. One of the meters was 50, one 30, and 20 were 2·73 per cent. slow, the per centage being on registered quantity.

South Shields, Sept. 5, 1873. W. J. WARNER.

RETORT-HOUSE CHIMNEYS.

SIR,—In the last number of the JOURNAL, Mr. Milne, referring to my paper, informs us that his chimney is built entirely of fire-bricks, and apparently of good area. As I remarked, all fire-bricks were not all alike good non-conductors. Possibly the fire-bricks may be of the best non-conducting material.

The rules I have laid down are based on the minimum temperature of chimneys—viz., 750° Fahr. Now, if Mr. Milne will observe the foot-note in the JOURNAL OF GAS LIGHTING, he will observe a temperature, I presume, very like his own chimney, where the tip of the pyrometer was destroyed in the test. Now we know that air heated from 750° Fahr. to 2500° Fahr., nearly doubles its velocity, or as 94 is to 178. I hope that this will solve Mr. Milne's puzzle.

Elland, Sept. 5. ROBT. DEMPSTER.

Legal Intelligence.

LIVERPOOL ASSIZES.—SATURDAY, AUG. 23.

(Before Justice QUAIN and a Special Jury.)

ANDERTON AND OTHERS *v.* THE HOME INSURANCE COMPANY, NEW YORK.

This was an action on a policy of insurance brought by the plaintiffs, Messrs. George Anderton and W. Aldred, as trustees of the mortgagees of the Hyde Chemical Company, formerly a manure company, but now carrying on the business of the distillation of gas tar, and the manufacture of naphtha, creosote, carbolic acid, and other products of tar, near Manchester. The policy was issued by the defendants, insuring the premises of the chemical company to the amount of £3000, and these works were destroyed by fire on Nov. 4, 1872.

Mr. HOLKER, Q.C., and Mr. CROMPTON were the counsel for the plaintiffs; Mr. BENJAMIN, Q.C., and Mr. ROLLAND were for the defendants.

From the evidence it appeared that in April, 1868, the Hyde Chemical Company was formed for the purposes of extracting chemical products from pitch tar, and that shortly after this time the plaintiffs, acting as trustees of the company, endeavoured to effect an insurance with the Yorkshire Insurance Company. The agent of this company, after making an inspection of the premises, refused to accept the risk. Overtures were then made to the English Insurance Company, and after some negotiations the plaintiffs succeeded in obtaining a policy on the premises at the rate of £1 3s. 6d. per cent.

In the course of 1870 the business of the English company was transferred to the defendants, and at Lady-day, 1871, the policy was granted upon the old terms, and without holding another survey, upon the renewal of which, in 1872, the present action was brought. The same agent negotiated and received the premiums upon these different policies, and earned his commission in respect of them. The policy contained a condition to the effect that any alteration made in the property insured after the insurance whereby the risk was increased without the consent of the company endorsed upon the policy should void it, and upon this condition the case turned. At the time of the first policy with the defendants company, Lady-day, 1871, and until March, 1872, the works contained only four stills for distilling the tar, and there were no "coolers" to receive the pitch which resulted from the process, but it was run straight off through pipes into the pitch pits prepared to receive it. There was also a shed in which no process of manufacture was carried on, but which was used merely as a warehouse of combustible materials. In the interval between March, 1872, and November, the date of the fire, in anticipation of larger manufacturing requirements in the winter, by reason of having made a contract with the Corporation of Manchester for the whole of its gas tar, the distillation of which would, the plaintiffs stated, commence in the winter, the shed was pulled down, and six new stills were erected on the site of it, and a closed iron tank, termed a "cooler," was provided, both in connexion with the four old stills and the six new ones, for the purpose of avoiding the nuisance—and the plaintiff said the danger—of the hot pitch being exposed to the open air, and giving out vapours in running from the stills to the pits.

The plaintiffs case was that although these alterations and additions were made before the date of the fire, and without notice to the company, they did not increase the risk, because only the old number of stills—namely, four—were at work at one time, and the effect of the "coolers" was to diminish rather than increase the danger. Besides the evidence of Mr. Anderton and of the secretary to the plaintiffs company, two agents of the Yorkshire Insurance Company stated that in their opinion the risk was not increased, and that they would have insured the premises upon the old premium notwithstanding the alterations. The origin of the fire was said to have been the negligence of a workman in lighting the tow which, steeped in creosote, is wrapped round the taps through which the pitch has to be run, and is set fire to in order to keep the pipe heated and the pitch liquid on the tap of one of the stills while the pitch was running from a neighbouring still, and fire was thus communicated to the vapours from the running pitch, which exploded and spread fire over the whole of the works.

The defendants case was that the addition to the number of stills was not only made with a view to the increase of the business, but that it had already produced that result, as was shown by the plaintiffs own returns of the business done in their answers to interrogatories, and with the increase of business necessarily that of risk. Moreover, it was said that the origin of the fire was not the negligence of a workman as alleged by the plaintiffs, but the direct explosion of the vapours confined in one of the coolers, in consequence of their becoming mixed with air finding its way through a leak, by means of which a great surface of boiling pitch was set on fire, and the instant destruction of the works resulted.

On the conclusion of the speech of the learned counsel for the defendants, the jury stated that they had made up their minds in favour of his clients, and there was, therefore, a verdict for the defendants.

Miscellaneous News.

WOLVERHAMPTON GAS COMPANY.

The Ordinary Half-Yearly General Meeting of Proprietors was held on Aug. 26—Mr. J. UNDERHILL, the chairman of the directors presiding.

The SECRETARY read the forty-third half-yearly report, ending June 30, which indicated that the total income for that period amounted to £21,797 19s. 10d., whilst the expenditure was £16,181 0s. 5d. The directors recommended the payment of the usual 5 per cent. dividend. Notwithstanding the advanced prices of coal, the directors had resolved not to increase the price of gas, at all events during the present year. During the interval between this and the preceding meeting the usual alterations and repairs at the company's two gas manufacturing stations had been going forward, and the directors had every confidence that the entire plant is in so good a working state as to enable them to meet any unexpected demand that might arise. The directors regretted to notify the death of their late esteemed colleague, Mr. W. Savage, with one exception the oldest director of the company. The vacancy had been filled up by the appointment of Mr. H. Loveridge.

The CHAIRMAN, in moving the adoption of the report, remarked that the previous meeting was noticeable for its important, and the present one for its uninteresting, character. There was an old aphorism that a nation was always in the most flourishing condition when it was not distinguished by any particular trait; and he thought the saying was applicable to the affairs of the Wolverhampton Gas Company. They were in a quiet, but a most satisfactory, condition. After alluding, in feeling terms, to the death of Mr. Savage, the chairman went on to say that the report indicated that the directors had decided not to augment the price of gas this half year. What they might be necessitated to do after Christmas would be dependent upon the price of fuel. The cost of coal was very high, and to some the prospects appeared only favourable to higher quotations; still, he considered, in the present condition of trade, it was too excessive to be permanent, and would eventually recede. He concluded by expressing an opinion that the directors desired to behave liberally not only to the shareholders but also to the public generally.

Mr. COX seconded the adoption of the report, which was carried.

The CHAIRMAN then proposed that a dividend of 5 per cent. be declared.

Mr. SAVAGE seconded the motion, which was agreed to; and on the motion of Mr. BLACKBURN (Walsall), seconded by Mr. WARNER, a vote of thanks was passed to the directors, which closed the proceedings.

RATCLIFF GASLIGHT AND COKE COMPANY.

The Half-Yearly General Meeting of the Shareholders of this Company was held at the Offices, Cable Street, on Friday, Aug. 29—J. E. BROMLEY, Esq., in the chair.

The SECRETARY (Mr. H. J. Baddeley) read the notice convening the meeting, and the following report and statement of accounts:—

The directors have the pleasure of submitting their report and accounts for the half year ended June 30, 1873.

The accounts, which have been duly audited, show a net profit of £3915 13s. 11d. The directors recommend that a dividend upon the paid-up capital of the company after the rate of 5 per cent., for the half year ended June 30, 1873 (less income-tax), be now declared, payable on and after the 4th day of October next, and that the balance be invested in Government securities to form the reserved fund authorized by Act of Parliament.

Dr. *Trade Account, for the Six Months ended June 30, 1873.* *Cr.*

Coals			£10,112	4	1	Gas	£15,548 3 5
Purifying materials			68	12	6	Public lighting	1,892 2 2
Salaries of engineer and clerk at works			385	0	0	Rental of meters	116 1 0
Wages			1,880	6	6	Coke	5,366 7 7
Repairs and maintenance of works and plant, and labour	£3,003	16 7				Breeze	73 11 5
Less old material sold	45	6 10				Tar	694 0 1
			2,958	0	9	Liquor	1,335 17 1
Salaries of inspectors and clerks in office			350	4	0	Rents	109 6 7
Repairs and maintenance, distribution, and labour			590	18	6	Miscellaneous receipts	239 18 2
Repairing and renewing meters			324	7	5		
Lighting and repairing public lamps			345	4	1		
Rents			130	17	0		
Rates and taxes			503	13	11		
Directors allowances			400	0	0		
Salaries of secretary, accountant, &c.			386	7	6		
Collector's commission			216	1	0		
Stationery and printing			49	17	0		
General establishment charges			101	12	1		
Auditors			15	15	0		
Depreciation-fund (leaseholds)			110	0	0		
Bad debts			136	8	3		
Interests on borrowed capital			391	15	0		
Net profit			5,915	13	11		
			£25,373	7	6		£25,373 7 6

The CHAIRMAN moved the adoption of the report, and in doing so said it was not necessary for him to offer many observations. It was gratifying to be able to assure the meeting of the continued prosperity of the undertaking, and that, notwithstanding all the anxieties arising from the advanced price of coal and labour, they were able to declare a 10 per cent. dividend out of the earnings of the half year.

Mr. PITT seconded the motion, and said he thought that the directors and every one connected with the management of the company were entitled to the confidence and gratitude of the shareholders for the manner in which they had carried on the affairs of the company amidst the difficulties with which they had been surrounded.

Mr. WILKINSON said he thought it would be well for the future to print and publish the accounts of the company prior to the half-yearly meetings.

Mr. PITT considered that it would be very objectionable, and, as every shareholder could obtain any information he desired on application to the secretary, it was a needless proceeding.

Mr. R. JONES said he did not think any harm could arise out of the publication of the accounts; in fact, they were published annually in the elaborate form in which the company were required to furnish them to the Board of Trade. On the other hand, seeing that every proprietor was entitled under the Act of Parliament to go to the office and examine all the accounts of the company, there was not much force in the request for a prior publication. The last number of the JOURNAL OF GAS LIGHTING had given a most detailed analysis of the working of the company, which was highly satisfactory—in truth, almost too much so. As a young proprietor, he confessed that an examination of the accounts of the company greatly astonished him. He happened to be the engineer of a large metropolitan company, in which the working was always regarded as very excellent, and therefore he felt that he was able to form a clear and correct judgment on these accounts. They were, to his mind, most admirable. The working of the company showed that great care had been bestowed upon it by the engineer who produced these results, by the secretary who husbanded them, and by the directors, upon whom the onerous responsibility of the whole concern rested.

The motion was put, and carried unanimously.

The CHAIRMAN moved—"That a dividend for the half year ending the 30th of June last, upon the paid-up capital of the company, at the rate of 5 per cent., less income-tax, be now declared, and that the balance of net profit be invested in Government securities to form a reserve-fund."

The motion was seconded, and carried.

On the motion of Mr. R. JONES, seconded by Mr. WILKINSON, a vote of thanks was given to the chairman and directors, for the care and attention bestowed by them on the business of the company, a compliment which the chairman duly acknowledged.

On the motion of Mr. NUTTER, thanks were also voted to the secretary, and the other officers of the company.

The SECRETARY said it was his pleasing duty once more to acknowledge the kindness with which the proprietors always received him. For himself and for the other officers, he could assure the meeting that it was their earnest desire to give satisfaction, and that they felt themselves rewarded in these expressions of the approval of the proprietors.

Mr. PITT, in complimentary terms, proposed a vote of thanks to Mr. Henry Jones, the company's engineer, which was cordially seconded by Mr. H. Baddeley, the senior director, and carried unanimously.

Mr. H. JONES acknowledged the vote, and said that while he had endeavoured faithfully to serve the company, he was afraid his efforts fell far short of deserving the high encomium which the mover and seconder of the resolution had passed upon them. He felt amply rewarded for all his exertions in the results, which had on this occasion been approved by the meeting.

Thanks were then voted to the auditors, and the proceedings terminated.

SOLIHULL GAS COMPANY.—The annual meeting was held on the 22nd ult.—the secretary (Mr. E. O. Smith) presiding in the absence of the chairman. The statement of accounts for the year ended on the 30th of June showed that the expenditure amounted to £572 12s. 5d. The largest item was for coal, the cost of which amounted to £377 7s. 5d. The income amounted to £779 11s. 7d., leaving a balance in favour of the company of £206 19s. 2d. The receipts were made up of the following items:—Realized by the sale of gas and meter rents, £611 5s. 11d.; sale of products, £119 18s. 7d.; stock on hand, £30 10s.; and balance of last account, £17 17s. 1d. The reserve-fund account showed that the original balance of £150 had been reduced to £105 10s. 5d., by the purchase of meters. The report was adopted, and a dividend at the rate of 6 per cent. declared.

LANCASTER GAS COMPANY.

The Annual Meeting was held at the Offices, St. George's Quay, on Wednesday, Aug. 27—Mr. E. D. DE VITRE, chairman of the board of directors, presiding.

Mr. FLEMING (manager and secretary) read the report of the directors, which was as follows:—

The accounts for the past year have been audited and are now submitted for your inspection and approval. The works in course of erection at last report are now completed, but owing to the unsettled state of the labour market much time has been lost to the great detriment of your company.

It is a matter of gratification to your directors that, notwithstanding the enhanced price of coal and the general advance in wages, they have, nevertheless, been able to adhere to their old rates of charges for gas to their consumers. It will be with great reluctance should circumstances compel them at any time during the ensuing year to make an advance in price; but the out townships, owing to their limited consumption, will be placed on the same footing as ordinary consumers for the public lamps.

The property recently purchased in the market-place is now undergoing a thorough reconstruction, for the purpose of being converted into an office for the general transaction of the company's business, together with a suitable show-room for gas-fittings. For the above alterations and other improvements the directors find it necessary to obtain your sanction to borrow a further sum of money not exceeding £2000.

The directors, out of respect to the memory of the late Mr. Gregson, beg to record their high sense of his value as a member of the board. He took an active part in the formation of the company in 1825, and was interested in its prosperity to the period of his death.

The profits for the past year amount to £2976 14s. 10d., which, with the balance of £881 4s. 8d. from last year's account, gives a sum available for dividend of £3857 19s. 6d., from which the directors recommend a dividend for the year at the rate of 10 per cent. (less income-tax), payable on the 1st day of September next, leaving a balance to be carried forward to next account of £901 15s. 2d.

The CHAIRMAN, in moving the adoption of the report, said the shareholders would remember that last year there was an apprehension that the company would not be able to maintain its position during the current year in consequence of the great increase in the price of coal and labour. The directors had, however, been able to go on without any alteration in the price of gas or in the dividend. They had still a reserve in hand, and they thought they could see their way to supplying their customers without making any change; that they would be able to realize the same profit and satisfy the public with the gas supplied at the ordinary price. They had only been able to do this with the most rigid economy, and with some detriment to the general interests of the establishment. Misfortunes had arisen during the year, and some of the shareholders present would be aware that at one time during the year the gas was heavy and impure, but it arose from circumstances over which they had no control, and which did not depend upon the quality of the coal. They promised to make an attempt to go on without raising the price to consumers, and they hoped to meet their shareholders next year with a statement as satisfactory as the present. The difficulties of this would be seen when he told them that the price of coal consumed at the present time at their establishment was 75 per cent. dearer than it was two or three years ago; and the price of labour had increased from 11 to 20 per cent. in the same period of time. Happily, a judicious extension of works and an increase in the consumption had enabled them to deliver gas at the same price as they had hitherto done. There was one paragraph in the report, however, to which he would just allude. It expressed regret at the loss of their old colleague, Mr. B. P. Gregson. He (the chairman) had been for 30 years connected with that establishment, and, with a brief interval only, he had had Mr. Gregson as his colleague. During the whole of that time that gentleman took a most active interest in the prosperity of the gas company. He looked upon himself as father of the company, having been one of the original promoters in 1825. The directors, one and all, entertained the greatest respect for him, and had derived great advantage from his opinion, especially in matters connected with engineering. He (the chairman) was sure the meeting would agree with him when he said that the people of Lancaster had cause to regard the memory of the late Mr. Gregson with respect. He concluded by proposing that the report of the directors be received and adopted.

The motion was seconded and carried unanimously, and a resolution approving of the accounts submitted to the meeting was also adopted.

The CHAIRMAN then proposed that a dividend at the rate of 10 per cent. on the share capital be paid on the 1st of September, less income-tax, and the motion was seconded and carried unanimously.

Mr. M. SIMPSON proposed—"That the directors be authorized to borrow a sum of money not exceeding £2000 as they may think expedient."

Mr. W. G. WELCH seconded the motion, and it was agreed to without discussion.

On the motion of Mr. W. BARKER, seconded by Mr. EDMONDSON, Mr. James Dickinson and Mr. Thomas Howitt were re-elected directors of the company; and Mr. HOWITT briefly returned thanks.

Mr. MARSHALL proposed, and Mr. M. SIMPSON seconded, the re-election of Mr. Thomas Gardner as auditor, which was also agreed to.

Mr. GARDNER, in thanking the meeting for the confidence shown in him by his re-election, said he was merely a junior assistant; he had a most able and valuable colleague, whose services he hoped, for the interests of the company, would be continued for many years.

Mr. H. GREGSON proposed a vote of thanks to the chairman and directors for their services on behalf of the company. He was quite satisfied that no shareholders could have their interests better cared for than the Lancaster Gas Company. At the same time he would suggest to the directors that they should keep their eyes open as to what was doing in other companies.

Mr. M. HARRISON seconded the motion, which was agreed to.

The CHAIRMAN, in acknowledging the compliment on his own behalf and that of his brother directors, said for himself he must confess that he had great difficulty in keeping his eyes open so as to make them useful; but he dare say they would know that his friend alluded to the recent experiments at Chichester with water gas. The directors had seen the reports of these experiments, and they were of opinion that there was considerable value in them, and that it was quite possible they might turn out a great boon to the public at large if the consumption of coal could be diminished. The shareholders must not think, however, that it would be all profit in that direction, because, no doubt, one of the results would be a great increase in the value of petroleum if gas companies found it desirable to manufacture water gas. This matter would not be lost sight of, and the directors would take such steps as they might think justifiable on satisfying themselves of the practicability of introducing anything of that kind into the works. Before taking any such important steps, however, they would call the shareholders together and take their opinion upon it. In conclusion, the chairman eulogized the services of the manager, and said the duties of the directors were comparatively light. There was a degree of method and routine in the management of the works which made everything work harmoniously and satisfactorily for the interests of the company, and for all this they were deeply indebted to their active and intelligent manager, Mr. Fleming, who was always ready to devote his best energies in promoting the prosperity of the concern.

Mr. EDMONDSON said the chairman had anticipated him in his remarks respecting their manager. For several years it had been his privilege to propose a cordial vote of thanks to Mr. Fleming, and his pleasure in doing so increased from year to year. Mr. Fleming was essentially the right man in the right place, and he had great pleasure in proposing that the cordial thanks of the company be accorded to him for his able services.

The motion was unanimously adopted.

Mr. FLEMING, in returning thanks, said he considered Mr. Gregson's advice, as to keeping their eyes open, very proper. As to the position of the company, they would have to exercise economy to keep up the dividend without increasing the price of gas. He expected there would be an increase of £1000 in the cost of coal alone, and this would trench considerably on their balances. Things looked very threatening, and he was afraid they would have to increase the price of gas.

In answer to Mr. Simpson, Mr. FLEMING stated that the new system of making gas could be applied at their works for a very small outlay.

BRIGHTON (OLD) GAS COMPANY.

The Ordinary Half-Yearly Meeting of Proprietors was held at the Company's Office, 13, St. Swithin's Lane, London, on Thursday, Aug. 28—Mr. G. WARNE in the chair.

The following report and statements of account were presented:—

The gas-rental for the past six months shows a small increase in the demand for gas.

During the earlier portion of the half year there was a continuance of delays in loading coal ships, but the directors are happy to report an improvement of late in this respect. In accordance, therefore, with the long-approved practice of this company, they are availing themselves of the opportunity to secure a good stock of coal towards the heavy consumption of winter, and as a provision against emergencies. The new coal-shed, recently completed, adds seasonably to the covered coal storeage space.

In consequence of the enormous increase in the cost of materials and mechanics wages, the directors and superintendent studiously avoid all immediate outlay not absolutely required; and the only extensions now in progress are some which have become requisite in the condensing and purifying departments; these, which are being effected in the most economical manner, are expected to be completed in time for the forthcoming season, as will also the ordinary annual restorations.

The directors recommend the declaration of a dividend on the paid-up capital of the company of 5 per cent. for the half year ending the 24th of June last, less income-tax: the same to be payable on and after the 8th of September next.

Dr. *Profit and Loss Account, for the Half Year ending June 24, 1873.* *Cr.*

Coals	£11,050	4	6	Gas and meter rental	£15,044	6 11
Materials for purification	317	2	0	Coke, &c.	6,580	12 6
Wages	1,623	16	1	Old stores, &c.	41	10 2
Rent, rates, and taxes	290	17	6			
Salaries, collectors commission, directors, and auditors	1,457	5	3			
General charges	173	5	3			
Wear and tear	1,262	4	2			
Depreciation account	480	0	0			
Bad and doubtful debts and allowances	317	2	3			
Interest on debentures	225	0	0			
Contingency-fund	325	0	0			
Balance	4,144	12	7			
	£21,666	9	7		£21,666	9 7

Dr. *Balance Sheet, June 24, 1873.* *Cr.*

Capital	£84,400	0	0	Expended on works	£85,295	14 8
Received on account of call due June 25, 1873	1,470	0	0	Works in progress	213	0 0
Debentures	9,000	0	0	Meters	2,157	10 11
Contingency-fund	5,195	12	6	Coal, coke, &c., in stock	6,895	15 6
Depreciation account	1,757	3	11	Mains, service-pipes, and general stores in stock	1,397	12 11
Coal insurance account	1,314	13	4	Sundry debtors for gas	6,221	7 0
Dividends unpaid	1,241	7	4	Sundry debtors for coke, &c.	2,137	6 1
Interest on debentures	103	13	8	Cash at bankers and in hand	5,939	0 5
Tradesmen's accounts, &c., owing	1,451	4	7			
Balance from last half year £178 19 7						
Balance this half year, as above 4,144 12 7						
	4,323	12	2			
	£110,257	7	6		£110,257	7 6

The report was adopted, the dividend recommended therein declared, and thanks, as usual, were voted to Mr. Rutter, Mr. Weare, and the other officers of the company.

THE GREATEST GAS WELL IN THE WORLD.—The Newton gas well, six miles from Titusville, Pennsylvania, discovered last year, still continues to pour forth its gaseous treasures at the rate of 3 million cubic feet of gas every day of 24 hours. The gas issues under a pressure of from 20 to 30 lbs. per square inch, and for the most part goes to waste. Pipes have been laid to Titusville, and some 250 dwelling-houses, shops, &c., are now supplied with the gas for illumination and fuel. For heating purposes it is admirable, but for illumination it requires to be passed through naphtha, as it is deficient in carbon. This well may be justly regarded as one of the wonders of the world. If the bowels of the earth in its vicinity were transparent, and the owners could satisfy themselves of the continuity of the gas flow, we presume that pipes would be laid from the well to several of the large cities, such as Pittsburgh, Cleveland, and Buffalo, distant from 130 to 150 miles. We have heretofore published accounts of the gas wells at Painesville, Ohio, and other places. But we believe that the quantity of gas delivered by the Newton well exceeds the combined supply derived from all other wells in the country.—*Scientific American.*

TAMWORTH PUBLIC LIGHTING.—At the meeting of the Tamworth Town Council, on the 2nd inst., the mayor reported that the committee had had an interview with some of the directors of the gas company, and the result was that the company held to their former terms—they would not lower the price for lighting, &c.; they were unwilling to sell the posts and lamps to the council, and would not allow them to be lighted by the town, and they would require that a meter should be attached to each lamp. On the question of removing the present lamp-posts, the town-clerk (Mr. Nevill) said he thought that the council had power to remove the present posts after due notice, but he should like this and other things connected with the subject submitted to the opinion of counsel. Mr. Bailey said they could put up new posts, and the company would be compelled to take gas to them. They would then avoid all law proceedings. The mayor said this was very desirable. Mr. J. E. Cox protested against the manner in which the town was treated by the gas company. The company compelled Bolehall to find their own lamps and posts, and now, when they wished to do the same, the company put every obstruction they could in the way. Mr. Baraclough (inspector) said that many tradesmen had stated that they should be willing to put lamps up and supply them from their own meters sooner than submit to the exorbitant terms of the company. Mr. Hamel said it was a good suggestion, and he thought, if they had no other alternative, they could avail themselves of this means of lighting the streets for the present winter. He did not like antagonism, but in this case they were almost driven to it. Mr. Bailey said he had a conversation a few days before with a gas director, and he wished the matter settled in some way; he did not care how. It was shown by Mr. Clarson that if they took the terms of the gas company for three years, at 25s. per lamp, it would come to £315; but if they purchased lamps, &c., of their own, and took to the lighting, painting, &c., at the end of three years—after the lamps, &c., had been paid for, and reckoning £40 per year for lighting, &c.—they would have a balance in hand of £24 9s. 6d. Mr. Cox moved—"That the council be empowered to purchase lamp-posts, &c., at once, to replace those of the company." This was seconded by Mr. Aitken, and carried unanimously.

NEWCASTLE-ON-TYNE AND GATESHEAD GAS COMPANY.

The Annual Meeting was held on Wednesday, Sept. 3—Alderman HEDLEY in the chair.

The SECRETARY (Mr. Hardie) read the report of the directors, which was as follows:—

The past year has been most important in the history of gas companies. During its continuance gas coal advanced to the unprecedented price of 25s. per ton, and notwithstanding favourable contracts on hand, its actual cost to the company for the year was £60,083 against £22,831 in the year ending June 30, 1872, or an average cost of 16s: against 6s. 7¼d. per ton. The directors are happy to say that the balance-sheet for the year is much more favourable than they anticipated, owing to increased receipts for gas, coke, and other residual products, and to a saving in working expenses. The total receipts for the year are £115,526 12s. 7d., and the expenses £99,626 1s. 5d. leaving a balance of £15,900 11s. 2d. applicable to dividend. In March last intermediate dividends of 1½ per cent. on A stock, 8s. 9d. on B stock, and 17s. 6d. on C stock were paid; and the directors are glad to be enabled to recommend, for the past half year, dividends of 5 per cent. on A stock, 1¾ on B stock, and 3½ on C stock, making the total dividends for the year 6½ per cent. on A stock, £2 3s. 9d. per cent. on B stock, and £4 7s. 6d. per cent. on C stock, and leaving £1650 11s. 2d. to be carried forward. The directors were authorized in February last by the proprietors to apply to Parliament for an advance in the maximum price of gas, to enable them to meet the great increase in the cost of coal, material, and labour, and a satisfactory arrangement was made with the Corporations of Newcastle and Gateshead, to which the House of Commons would have agreed, had not the House of Lords, in the meantime, passed a resolution debarring gas companies who advance their maximum price from paying a higher dividend than 5 per cent. An Act of Parliament, authorizing an advance in the maximum price, and also the consolidation of the stocks of the company, received the Royal Assent on the 7th of July last. The directors have exercised the powers given them by this Act, and have advanced the price of gas 6d. per 1000 feet from the 1st of July last. This they consider an extremely moderate increase, and one which will not press heavily upon the consumers. Under the Consolidation Clause, the proprietors of A stock will receive £142 17s. 1d., of B stock £50, and of C stock £100, for each £100 of these respective stocks. On the consolidated stock, a maximum dividend of 5 per cent. will be payable so long as the price of gas exceeds the old rate of 3s. 4d. per 1000 feet, but should coal come down in price so as to enable the company to return to the old charge, the proprietors will then be entitled to a maximum dividend of 7 per cent. The directors have bought an additional piece of land adjoining their present property at Redheugh, which will be of great value when the new works there are proceeded with. In the meantime, the Elswick works have been extended so as to meet the requirements of the coming winter. During last year 9 miles of pipes have been laid, and 120 additional lamps have been erected.

The CHAIRMAN moved—"That the report be received and adopted, and that dividends be declared for the year ending the 30th of June, 1873, of 5 per cent. on A stock, 1¾ on B Stock, and 3½ on C stock, making the total dividends for the year 6½ per cent. on A stock, £2 3s. 9d. per cent. on B stock, and £4 7s. 6d. per cent. on C stock, and leaving £1650 11s. 2d. to be carried forward." He said he was exceedingly sorry that the directors were not able to lay before them such a good balance-sheet as that to which the company had been accustomed for many years past. It was not necessary for him to go much into detail as to the cause. Coal, when they met on the 5th of September of last year, was then selling at the unprecedented price of 26s. per ton; and when they had met again in February, it had then got down a little; but it was still 24s. per ton, against something like 6s. or 7s. per ton for many previous years. Of course, fortunately, before they had got through contracts into which they had entered in June, 1872, the price had come down considerably; and this saving, and the increased amount they had received from coke and from gas, together with some saving in working expenses, had enabled the directors to lay before them a comparatively favourable balance-sheet—indeed, one which was much better than had been anticipated. The directors were able to recommend the payment to the shareholders of 5 per cent. on the A stock, 1¾ per cent. on the B stock, and 3½ per cent. on the C stock. A meeting was held in February last, at which the directors obtained power to ask Parliament for an increase on the maximum price of gas, and the directors had a good many meetings with the committee of the corporation, by whom they were met very fairly. An arrangement had been made to the effect that if the price of gas was not raised more than 6d. per 1000 feet, the directors should be allowed to pay a full dividend upon consolidated stock; if it was raised to 9d., 6½ per cent.; if to 1s., 6 per cent.; and if the price was advanced still further, then the dividend paid to shareholders was not to be higher than 5½ per cent. According to the agreement with the corporation, the company would have had power to raise the price so as to obtain the last-named dividend. It was an agreement as between manufacturers and consumers, and it would have been confirmed by the House of Commons, but unfortunately the House of Lords, for some reason which they knew best, passed a general resolution to the effect that no gas company, after obtaining an advanced maximum price, should be allowed to pay more than 5 per cent. dividend. The directors thought then, and still thought, that it was unjust to interfere with private trading companies in that way, but they had no option in the matter; their bill was refused to be passed unless it was framed according to the conditions of the Lords resolution; and the utmost dividend they were now able to pay to the proprietors was 5 per cent. upon the consolidated stock. Fortunately the House of Lords had agreed to the consolidation of stock, so that the A stock, which had always paid 10 per cent., would receive £142 17s. 1d. of the consolidated stock, and 5 per cent. upon that would amount to 7, and 7 per cent. upon what was called the 10 per cent. stock. The B stock would receive 2½ per cent., and the C stock 5 per cent. The Act of the company was limited to four years, so that if the price of coal was not reduced at the end of that time to a price that would enable the company to reduce its charges to the old rates, no doubt Parliament would then give to the shareholders what they were fairly entitled to—namely, a dividend of 7 per cent. upon the consolidated stock. In the meantime, however, they had no chance of paying more than 5 per cent. It appeared to him that the interference of the House of Lords ought not to have taken place. The shareholders of the company ought to have had a fair and reasonable dividend. There had been an increase—an enormous increase—in their business, yet their dividend was reduced. During the past year the quantity of gas made was very large indeed. During the year ending the 30th of June, 76,068 tons of coal were carbonized, as against 69,154 tons in the previous year; making 706 million feet of gas, as against 659 million feet. And if they went back for eight years, to the year 1865, they found the increase was 56 per cent. The quantity of coal carbonized in the year ending June 30, 1865, was 48,373 tons; last year it was 76,068 tons. They would all remember that when their works were increased some years ago the House of Lords was asked to allow fresh capital to bear a higher interest than 7 per cent. At that time this rate was considered very low as compared with the 10 per cent. to which they had been accustomed; but now that coal had gone up in price—a circumstance over which gas companies had no control—the Lords stepped in and reduced their 7 per cent. to 5 per cent. So it was; the Lords had got power, and the directors were obliged to submit to the resolution they had passed. He might mention that in consequence of the great increase in the business of the company, the directors had thought it well to call in Messrs. Monkhouse, Goddard, and Co., professional auditors, to go through the books, and to report monthly. As to the works at the Redheugh, alluded to in the report, there had not, in consequence of the uncertainty as to what would be their position some time hence, been any more extensions made; and with regard to the Elswick works, sufficient additions had been made to tide over the next winter, but if the demand still continued to increase, there was no doubt they would have to proceed with an extension at the last-named place. And this point was one that would have to be seriously considered. He for one had told Lord Redesdale that if the Lords insisted upon reducing the dividend, he feared there would be much difficulty in getting capital to extend works so as to meet the requirements of the public. But he would call the attention of the meeting to the fact that this dividend of 5 per cent. was certain and secure, and he hoped the shareholders would support the directors in making any extension of the works that might be required. He was reminded that if coal came down to the old rates before the end of the four years, the company would then be enabled to pay the shareholders the full dividend if they were provided with the means of doing it. He for one did not believe coal was likely to come down to the old price of 6s. or 7s. per ton; the day appeared to him to be past and gone.

Alderman BROWN seconded the motion, and hoped the time would arrive—he did not despair so much as the chairman—when they could return to their 7 per cent. dividend. By carrying on the works economically, and by adopting the best plans for producing gas, he had some hopes that they would realize their 7 per cent. in the future. But, at present, as they had to pay 17s. per ton for coals, he could not see how they were to do more than pay 5 per cent. for four years to come. After that period the Act would cease to be in operation, and they could, if they chose, adopt some other policy.

The motion was carried.

On the motion of the CHAIRMAN, seconded by Mr. LUPTON, the directors were re-elected.

The CHAIRMAN then moved the following resolution:—"That in the consolidation of stock every proprietor who may be entitled to a fractional part of stock of less value than £5 shall be required to sell the same to the company at par, and where he may be entitled to a fractional quantity above £5 and under £10 he shall be required either to sell the same to the company at par, or buy from the company at par so much as will make the quantity of stock he holds a multiple of £10." On account of the 10 per cent. stock being brought down to 7 per cent., the chairman explained, a great many odd sums would be created, and the above resolution was for the purpose of simplifying the keeping of the books, by making all odd amounts multiples of £10. Any shareholder who might have £102 6s. 8d. would have to sell the odd £2 6s. 8d. to the company at par; or if he was entitled to an odd £2 6s. 8d., then he could purchase to make up the difference between that sum and £10.

Dr. HUMBLE seconded the motion.

A SHAREHOLDER asked why a shareholder with an odd sum less than £5 might not purchase.

The CHAIRMAN pointed out that the directors were not empowered to create fresh capital, and that they only sought at present to equalize their capital.

The motion was carried, and the meeting then terminated.

SOUTH SHIELDS GAS COMPANY.

The Half-Yearly General Meeting was held on Friday, Aug. 29—Mr. WALLIS in the chair.

The directors report was as follows:—

In presenting the half-yearly report, your directors beg to congratulate the shareholders on the favourable state of affairs, as shown by the balance-sheet and accounts for the half year ending June 30. It will be remembered that 12 months ago your directors were under the painful necessity of stating that, owing to the increased price of all materials, large outlay for retorts, and the recent reduction in the price of gas, they were unable to pay the ordinary dividends without drawing slightly on the reserve-fund. Your directors, on this occasion, have much pleasure in being able to recommend the payment of similar dividends—viz., 4½ per cent. on the old and 3½ per cent. on the new capital of the company, which, owing to the very favourable contracts for coals for delivery to the end of June, economical management, and an increased consumption of gas, can now be done out of the profits accruing from the last half year's business, without the necessity of making any further inroads on the reserve-fund. Your directors have the satisfaction to state that for the last six months the report of the inspector (Mr. Pattinson) appointed by the corporation is most favourable, the average illuminating power having been up to the necessary standard. The dividend warrants will be payable, as usual, on the 8th of September.

The CHAIRMAN moved that the report be adopted, and, in doing so, said he was exceedingly glad to meet the shareholders under such favourable circumstances. They would see by the balance-sheet that the company still continued in its flourishing career. The directors had been able to recommend the maximum dividend without drawing on their reserve-fund, and at the same time to have something to carry forward for next half year. This state of things was indeed most satisfactory. Of course they had had to contend with the very high price of coals, labour, and materials connected with gas making, and it had only been by the greatest economy and perseverance that they had been able to accomplish what they had, and he hoped that what they had done had been satisfactory to the shareholders. It was true the company was in a prosperous position, but how long this favourable state might continue it was impossible to say. They had raised the price of the gas to the maximum outside their parliamentary borough. As the shareholders were aware, the directors had an idea of extending their works; but hitherto they had not been able to come to a conclusion with regard to a site. They had gone on struggling with the present works, but of course the time would come when they would be compelled to commence the erection of enlarged works. Of course this meant a very large outlay; but still they had no fear, from the increased revenue arising from the increased consumption of gas, that the company would continue to go on in the same flourishing manner as hitherto. The gas-rental this half year was £9810 19s. 10d., while in the corresponding half of last year it was £7892 8s. 11d., being an increase of £1918 10s. 11d. This was very gratifying, and there was no doubt the gas-rental would go on increasing, for there was no fear of the prosperity of the company.

Dr. ARMSTRONG seconded the resolution, and remarked that they were making as much gas as the works would produce, but in the course of a year or so they would have to add to them to meet the increasing demands of the district.

The CHAIRMAN, before putting the motion, said they had had Mr. Church, an eminent gas engineer, down from London, to give them some advice about the extension of the works, and he said that he never saw works of their size manufacture and distribute such a large quantity of gas as they did. This reflected great credit on the engineer of the company (Mr. W. J. Warner), who, he might remark, had been at the trouble to prepare a comparative statement of the produce of a ton of coals in the manufacture of gas by the South Shields Company and some other companies, and it was very satisfactory to know that the South Shields Company compared most favourably in this respect.

The motion was then put and adopted.

Mr. WM. ANDERSON moved—"That a dividend of 4½ per cent. on the old, and of 3½ per cent. on the new capital, be declared for the half year, payable on Sept. 8 by warrant on the company's bankers." They had been very much alarmed at the increase in the price of coals, but by careful management and great economy they were rather surprised to find themselves in a position to pay such a dividend.

Mr. H. HEWISON seconded the motion, which was carried.

Mr. DOUGLAS poposed a vote of thanks to the directors for the excellent manner in which they had managed the affairs of the company during the past year. Much had been heard of late about various artificial lights, but he believed that gas would still remain the paramount light, and there was no fear of it being superseded.

Mr. J. RIDLEY seconded the proposition, which was cordially adopted.

Mr. FAIRBAIRN, on behalf of the directors, returned thanks for the compliment paid to his colleagues.

Mr. DUNCAN moved, and Mr. S. OLIVER seconded, a vote of thanks to the chairman which was carried by acclamation, and the meeting terminated.

SUNDERLAND GAS COMPANY.

The Annual Meeting was held on Wednesday, Sept. 3—Mr. E. C. Robson in the chair.

The following report of the directors was presented:—

The directors of the Sunderland Gas Company herewith submit the results of the working of the company during the year ending June 20, 1873. The rise in the price of coals, labour, and materials, has been partially met by an increase in the price of gas, and by the augmented value of residual products; and your directors advise that the reserve balance be drawn upon to the extent of £571 7s. 7d., in order to pay the ordinary statutory dividends of all classes of stock. An interim dividend of 5 per cent. on the original stock, and 4½ per cent. on the additional capital was paid in March last, and your directors now recommend the declaration of a further dividend of 5 per cent. on the original stock and 4½ per cent. on the additional capital stock of the company, payable on the 15th day of September next. The directors trust that by the subsidence of the price of coal to a more natural and healthy level—by the maintenance of the value of tar, coke, and sulphate—and by the enforcement of a rigid economy in the management of the works—they may be enabled (with the assistance of the reserve balance) to pay a fair dividend during the coming year. The additional purifiers, scrubbers, &c., at Hendon, referred to in the last report, are now satisfactorily completed, and the cost debited to the capital account. Owing to the high price of iron, your directors have made as few extensions this year as was consistent with their duty to the public.

The Chairman, in moving the adoption of the report and accounts, said that last year he warned the shareholders that the high price of coal would very likely jeopardize their statutory dividend of 10 per cent., and the danger would be obvious when he told them the company had paid £22,957 for coal, against £11,878 in the previous year—nearly double the amount. The blow was, however, softened by the circumstance that they were enabled to get a high price for coke, and thus the amount received for residuals had been £9959, as compared with £5026 last year. The sale of coke was, however, difficult and uncertain. The greater part of it had to be shipped, and the countries which took it, for the most part, had their harbours blocked up with ice all the winter. It therefore left their hands slowly, and he might say that some which was contracted for early in the spring was still upon their premises. For the ammoniacal liquor they had a contract running which would terminate next Midsummer, after which he hoped they would have a better price, sulphate having risen in value. The contract for tar would end with this year, and they might hope for a better price for it also. They had gained £6269 from an increase in gas-rents, and had not yet felt the full benefit from their increase on the price of gas to 4s., because the increase did not take effect until October. The items of increase referred to had enabled them to maintain their dividend at 10 per cent. by taking £571 from the reserve-fund, in which a balance of £4023 still remained for some future period. As to the future, it was impossible to say that the 10 per cent. could be maintained, though there were circumstances which would encourage their hope of a fair and ample return for the capital invested. It was unavoidable that they must contract for coal at a still higher price, and probably in next year's balance-sheet they would have a further increase of £7000 or £8000 from this cause. Against that they had to set the gain from the abolition of discounts, from the increased price charged to the corporation for street lamps, and the increase to be derived from tar and ammoniacal liquor. Coke was an uncertain trade, and they would have to make the best market they could with it. He could not anticipate any great increase in the receipts from gas-rents as long as they had several large works to supply, two of them being their best customers. They might congratulate themselves that they did not carry their pipes out to North Hylton, which place was now a desert; in fact, owing to the high price of iron, they had made as few extensions as possible. They were by law restricted to a maximum price of 4s., and to a maximum dividend of 10 per cent., but he did not believe the Legislature would have imposed such restrictions if they could have foreseen so sudden a rise in the price of coal within two years. Parliament had conceded to the London companies the power of going to the Board of Trade for a revision of price when the price of coal rendered it necessary, but this had been refused to the provincial companies. They must, therefore, adhere to the bargain made by their Act until circumstances made it impossible for them to go on any longer, but he was not without hope that before a year was over coal would revert to something like a normal price.

Mr. Matthew said the price would come down through the development of new collieries, and the working of coal in places where it would only pay at advanced prices. As a manufacturing company, they had nothing to complain of, for they must have their ups and downs like other companies.

Alderman Alcock said they were in a very much better position than many companies in their own immediate neighbourhood.

The motion was put and carried, and a dividend declared in the usual way.

The retiring directors—Messrs. Robson, Bowey, Tate and Tindell—were re-elected, and the proceedings closed with a vote of thanks to the directors and chairman.

Weymouth Gas Company.—The report of the directors presented to the meeting of shareholders on the 14th ult. was as follows:—The directors have pleasure in informing the shareholders that, notwithstanding the high price of coals and other materials required for the manufacture of gas, the result of the half year's working, together with the balance brought forward from the last half year, warrants them in recommending that a dividend at the rate of 5 per cent. per annum be declared, free of income-tax, and the balance to be carried forward to the next half year. The dividends will be payable within eight days of the adoption of this report. The gas-rental for the half year is in excess of the corresponding half of last year by £58 4s. 6d. The directors are gratified at being able to introduce a new item in the revenue account—viz., ammoniacal liquor, which, together with a rigid economy in the expenditure, enables them to present at this time the satisfactory balance available for dividends.

Buenos Ayres Mutual Gas Company.—The *Standard* of Buenos Ayres of the 30th of July gives a long account of the works now in course of construction for this company. It concludes by stating that "everything appears to be splendidly planned out, and as far as we can see the arrangements are made with the utmost care, and specially to suit this country. The capital is half native, and half held by Mr. G. Bower, of St. Neots, a gentleman of great fame in gas and water works; it is one million hard dollars, say £200,000, of which 50 per cent. has been called up. The company hold the municipal contract for ten years from March 1, 1874, for not fewer than 4200 lamps, at $110 mlc. per month, which is equal to a yearly revenue of £50,000 for street lamps alone. We hear it is the intention of the municipality to at once extend the number to 5000 lamps, which will leave still the astounding number of 2700 kerosene lamps within the municipal radius. The mains when completely laid will be about 100 miles, of which about 50 have to be laid by the 1st of March, 1874. The main-laying has already begun, and the contractor's able representative, Mr. C. H. Smith, says he fully expects to light 2000 lamps by the time contracted. In case of default the municipality have a right to impose a fine of 2,000,000 mlc. Few enterprises have been started in these countries under more favourable auspices, possessing the municipal contract, and having as shareholders some of the largest customers, besides working with the most economical and improved machinery. Montevideo Company gave £27,000 profit last half year. Rio Company gave £62,000 profit upon six months working. So upon paper South American gas companies look very healthy. The old company of Buenos Ayres has regularly paid over 20 per cent. per annum, and we see no reason why with proper management the Mutual Company should not give the same.

LONGTON GAS COMPANY.

The Ordinary Half-Yearly General Meeting of this Company was held on Monday, Aug. 25—Mr. W. Webberley in the chair.

The following report by the directors was presented:—

The directors herewith submit the trade account for the half year ending Midsummer last, and the balance-sheet of the company for the same period.

During the half year a net profit of £1751 2s. 3d. has been realized, which added to the undivided balance of Christmas last makes a sum of £1974 15s. 10d. at your disposal, out of which your directors recommend that a dividend be declared of 10 per cent. per annum on the original shares, and 7 per cent. per annum on the ordinary 7 per cent. shares; and also that the arrears of dividend due on the original shares of 4 per cent. per annum, and on the ordinary 7 per cent. shares of 1 per cent. per annum, be paid for the half year ending Dec. 31, 1868, all free of income-tax, carrying forward a balance of £205 15s. 10d.

The directors have to report that the works and plant of the company have been maintained in a thorough state of repair.

The warrants for the dividends will as usual be made payable on the day of the meeting.

The directors who retire by rotation at this meeting are—Mr. John Aynsley, Mr. John H. Hawley, and Mr. Joseph Hulse, and they are eligible for re-election.

Profit and Loss Account, for the Half Year ending June 30, 1873.

Coals	£1318	17	11	Gas-rental	£3169	13	2
Purifying	63	17	3	Meter-rental	205	18	9
Wages	290	12	4	Coke, less labour and carriage	896	8	1
Repairs, apparatus and tools	141	5	4	Tar	173	4	9
,, Buildings	14	7	4	Ammoniacal liquor	96	9	2
,, Mains	10	0	2	Spent lime and sundries	9	17	1
,, Retorts	12	8	6	Sale of old materials	5	8	9
,, Meters and services	39	19	4				
Public lighting and repairs of lamps	77	2	6				
Trade charges and stationery, including interest and commission on banking account	79	0	6				
Directors fees	37	10	0				
Auditors ,,	3	3	0				
Rents, rates, and taxes, including rent of leasehold land	100	8	10				
Salaries & collectors commission	240	8	4				
Bad debts and allowances	18	1	10				
Interest on loans	90	1	11				
Deterioration of plant, mains, &c.	268	12	5				
	£2805	17	6				
Profit and loss	1751	2	3				
	£4556	19	9		£4556	19	9

The report and statement of accounts were deemed highly satisfactory by the meeting. They were unanimously adopted, and the retiring directors were re-elected.

ROCHESTER AND CHATHAM WATER-WORKS COMPANY.

The Half-Yearly Meeting of Proprietors was held on Tuesday, Aug. 29—Mr. J. Baird, chairman of the company, presiding.

The Secretary (Mr. S. N. Heckford) read the following half-yearly report:—

The directors, in presenting their report for the half year ended the 30th of June last, trust that it will be considered satisfactory. Owing, however, to the continued high price of coals the results of the past half year are not quite so favourable as otherwise they would have been. Still, the fact of their being able to pay off £200 towards the liquidation of preliminary expenses, after providing for the usual dividend of 6 per cent., shows that the company is progressing, and the directors hope that they may be in a position to pay off the remaining £300 by the end of the present year. The directors contemplate making an improvement in the large well-engine by converting it into a condenser; this will effect a saving in fuel, and add greatly to its efficiency; but as this engine is constantly in use, it cannot be dispensed with during the hot and dry weather, when there is an increased demand for water, except by working two other engines at much greater cost, and the directors are therefore compelled to postpone this greatly desired alteration until the ensuing winter. The directors recommend that a dividend at the rate of 6 per cent. per annum (free from income-tax) be declared upon all shares for the half year ended the 30th of June, 1873, such dividend to be payable on and after the 20th of September next, and that the sum of £248 18s. 7d., the balance of the revenue account, be carried forward to the next half year's account.

The statement of accounts showed that the sum of £41,700 had been received on capital account, the whole of which had been expended. The revenue account for the past half year showed a total of £4198, leaving, after the payment of all expenses, a profit of £1099. The reserve-fund now amounts to £2631.

The Chairman moved the adoption of the report, and remarked that there were two important facts in the report to which he wished to direct attention. The first was the heavy item paid for coal during the past half year. In 1872 the price was 14s. 8d., whereas during the past half year they had paid £1 17s. 6d. per ton. With regard to the alterations and improvements carried out in the engines and machinery, it was fortunate that the improvements just came in time, or the rise in the price of coal would have more seriously affected them. During the past half year the charge for coals had been £1193 against £850 for the previous half year. With the late increase in the price of coals, if they had not been pumping to advantage, the coals would have cost them £1700, so that the directors were amply justified in the outlay made to improve the engines which had been decided upon, as it had resulted in a saving of at least £500. The two large engines had been thoroughly overhauled and repaired, the results of their improved working, with the saving of coals, justifying the outlay on them. The directors, as the report stated, contemplated converting the well-engine into a condensing engine, which past experience fully justified their doing.

Mr. Williams seconded the motion, which was carried unanimously.

A resolution for the payment of a dividend of 6 per cent. per annum for the past half year was unanimously adopted, and votes of thanks to the directors, chairman, secretary, and auditors were unanimously passed.

Newport (Mon.) Gas Company.—The half-yearly meeting was held on Monday, Aug. 11—Mr. Thomas Gratrex in the chair. The secretary (Mr. E. Marfleet) having read the notice convening the meeting, the report of the directors and the accounts were presented, and it was resolved that dividends at the rate of 5 per cent. on class A shares and 3¾ on class B shares for the half year ending June 30 be declared. The retiring directors, Messrs. Gratrex and Brewer, and the retiring auditor, Mr. John Phillips, were re-elected. The chairman, in returning thanks, congratulated the shareholders upon the very satisfactory state of the company, and said it always afforded him the greatest pleasure to work with his brother directors. A vote of thanks to the chairman terminated the proceedings.

Gas Music.—The appearance of the new instrument, the pyrophone, invented by M. Frederick Kastner, which has a part in the score of M. Gounod's new musical drama, "Jeanne d'Arc," at the Paris Gaité, is expected with some interest. The instrument emits its sound by means of lighted gas circulating in glass tubes; the sounds, it is said, resembling simultaneously the human voice and an Æolian harp. The inventor of the new instrument was untrammelled by precedent, at all events.—*Figaro.* [Our readers will remember that Mr. Goddard, jun., of Ipswich, exhibited at the *soirée* of the Ipswich Science Gossip Society, in December last, an instrument of this kind he had invented, and which was called a "musical flame organ." See Journal of Gas Lighting, Dec. 31, 1872.]

SOUTH STAFFORDSHIRE WATER-WORKS COMPANY.

The Ordinary Half-Yearly Meeting of this Company was held at the Offices in Birmingham, on Thursday, Aug. 28—Mr. SAMPSON LLOYD in the chair—when the following report was presented:—

The accounts for the half year ending June 30, 1873, show an increase in the revenue from water-rates amounting to £978 3s. 11d. This increase is, however, more than counterbalanced by the additional charges on the expenditure side; and in the result, after providing for interest on mortgages and preference shares, there remains a balance of £1159 12s. 3d. applicable to dividend. Your directors therefore recommend the declaration of a dividend on the ordinary share capital at the rate of 1½ per cent. per annum, free of income-tax. The dividend warrants to be issued on Wednesday, Oct. 1, 1873. Your directors have observed with much anxiety the rapid growth of the expenditure on fuel. It has arisen partly from the enhanced price and partly from the larger quantity consumed. In the latter particular your directors confidently believe a considerable saving will now be effected by the use of the new engine at Lichfield. This new engine is in thorough working order, and the old engines are undergoing complete renovation; and the district reservoirs are again nearly full.

Dr. Profit and Loss Account, for the Half Year ending June 30, 1873. Cr.

Engine charges	£4,645	4	6	Balance brought forward, Dec. 31, 1872	£2,205	0	5
Maintenance of works	741	11	10	Deduct amount of 23rd dividend, declared Feb. 27, 1873	2,175	3	0
Wages, turncocks, &c.	443	3	4		£29	17	5
Directors attendance fees	135	0	0	Half year's water-rates	16,270	18	3
Salaries — secretary, resident engineer, and clerks	629	11	10	Service laying	111	11	0
Collectors commission	550	8	10				
Rents	308	10	9				
Rates	566	8	5				
Income-tax	147	14	2				
Incidental expenses	260	8	4				
Current law charges	5	0	0				
Discount to landlords	266	0	8				
Allowances	379	7	4				
Bad debts	12	12	6				
Interest on loans	2,091	7	8				
Ditto preference shares	4,170	4	3				
Balance carried down	1,159	12	3				
	£16,412	6	8		£16,412	6	8

The CHAIRMAN, in moving the adoption of the report and statement of accounts, said the report was not favourable, but the unfavourable features of it resulted from the transition state of the engine power of the company, which was alluded to at their last meeting, when they were just completing a large engine at Lichfield, its completion having been delayed for many months, greatly to the loss and inconvenience of the company. This, together with the increased cost of coal, had caused a reduction in the amount of dividend for the past half year. The Wood Green engine was now pumping the water at £2 18s. 6d. per million gallons, whereas the Lichfield engines, which had given them so much trouble, were costing them £6 16s. 6d. If they could reduce the cost of those engines to £2 18s. 6d., which he hoped, by paying attention to the consumption of fuel, they should do, they had all the dividend at once in that item. The increased income from increased rates had been fully equal to what they expected. The total income of the company for the half year was £15,612 17s. 9d., which was an amount they should have considered very favourable only a very short time ago, but owing to the extraordinary increase in the price of fuel the result for the shareholders was not so favourable as might have been anticipated. The supply to the district, he was happy to say, had, during the past half year, really been so good that there ought to be no complaint. The quantity supplied on the average to each house of five individuals had been 21½ gallons per head per day. The public were at the present time really having the water for domestic purposes at a price under its fair value. The company could not increase it, owing to the Act of Parliament; but the price which they were paying for it was not remunerative to the company, and if it were not for the trade supply, which was a very large item in the accounts, the result would be very unfavourable. Whether, by-and-by, they could get that altered by going to Parliament he was not prepared to say, but the price ought to be raised in justice to the shareholders. There had been a considerable addition in the number of houses supplied during the half year, which showed that the water was required, and the supply appreciated; but there was still a large number of houses, both in Oldbury and Dudley, not supplied, which rested with the proprietors and the local authorities.

Mr. WOODHILL, alluding to the engine charges of £4645 4s. 6d., said he found that the engine charges rarely exceeded £1600 for each half year up to 1872, and then there was a sudden jump to £2469. The charges for the past half year exceeded those of the corresponding half year of 1872 by £2175. That sum, if added to the profits of the half year, would yield £4 12s. per cent., and leave the surplus about the same as that which they had. The chairman's explanation did not appear perfectly satisfactory to him. If such an increase of the engine charges continued, the income of the company would barely suffice to pay the fixed charges. The increase this year was something surprising, and rather alarming. He was happy to hear that they might expect this would be an exceptional case. If it were not for the revenue for water-rates he thought they should not have had any dividend at all.

Captain TOWNSHEND reminded Mr. Woodhill of the increased price of fuel.

In answer to Mr. Woodhill, the CHAIRMAN explained that, owing to the engines being out of repair at Lichfield, they consumed six tons per day, and, with the increased cost of coals, that cost a considerable amount. The cost of coals this year was exactly £1000 more than last year.

Mr. BARNETT said the statement of accounts generally did not appear to him to be satisfactory. They appeared to be doing more business and earning less dividend. He thought they would be better without the small house water supply, for there was an immense deal of water wasted by small houses. He expressed a desire to have the item for coal separated from engine charges.

Mr. JESSON said they were bound to supply small houses.

Mr. HAMILTON said the engines must be in a miserably bad state of working, or were badly managed, else they could not consume so much fuel as they appeared to have done. He thought, from calculations he made, that the whole of the increased engine charges could not have gone in the excessive waste of fuel, but that there must have been something added to the engine charges which did not belong to them.

The CHAIRMAN explained that the increase had arisen entirely from the amount of fuel consumed, in consequence of the bad state of the engines. The engines were now in a forward state of repair.

Mr. JAMES seconded the motion proposed by the chairman. He said Mr. Hamilton had rather suggested that some other charges had been smuggled into the item for engine charges. He pointed out that there was an increase of £1760 for fuel only in the item, and out of the whole total there figured for coal £2900. He then stated that the directors had had many difficulties to contend with, and said they had been obliged to defend their interests against the Walsall Corporation in the matter of the Mines Drainage Bill, as well as to contend against inferences that they did not properly supply portions of the district. In reference to what the chairman said about going to Parliament to get the rate raised, he reminded them that they could not do that without expense. He thought it would be wise for them to leave it to the directors to determine whether they should make the application to increase the rates for the domestic supply, but he did not think they should do it until they had taken all circumstances into consideration.

Mr. WOODHILL asked if the rates were now at the maximum price.

The CHAIRMAN said they were in most districts.

After some further discussion, the resolution was carried.

On the motion of the CHAIRMAN, it was resolved—"That a dividend be this day declared on preference shares entitled to the same at the rate of 5 per cent. per annum, less income-tax; and a dividend on the Dudley preference shares at the rate of 4 per cent. per annum, less income-tax."

It was further resolved that a dividend be declared on the ordinary shares and capital of the company at the rate of 10 per cent. per annum, free of income-tax, the warrants for the demand of the same to be issued on Wednesday, Oct. 1, 1873.

Votes of thanks were passed to the chairman and directors, and the proceedings terminated.

DERBY WATER-WORKS COMPANY.

The Half-Yearly Meeting of this Company was held on Friday, Aug. 29—Mr. G. GASCOYNE, chairman of directors, presiding.

The following report was presented:—

The directors have to report to the shareholders that the gross receipts for the past half year have exceeded those of the previous half by £70 2s. 10d., and those of the corresponding half year by £294 9s. 4d.; but, on the other hand, by reason of the continued high price of labour, coal, and all other materials, and the interest of the additional outlay, the revenue expenditure has exceeded that of the previous half year by £227 4s. 2d., and that of the corresponding one by £536 18s. 9d. The nett profit realized is £2728 5s., and adding to this the surplus of £2189 3s. brought forward from the previous half year, there remains an amount of £4917 8s. available for dividend. From this sum the directors recommend the usual dividends of 10 and 7 per cent. respectively, amounting to £2793 6s. 8d., which will leave a surplus of £2124 1s. 4d. to be carried to the next half year, a surplus exceeding that of the corresponding half year by £150 17s. 5d. The contingent-fund, in addition to the above, now amounts to £2959 8s. 9d. Although very serious delays have occurred in the construction of the new engines, boilers, and machinery, beyond the power of the directors to obviate, these are at length sufficiently advanced to be available, if called upon, in aid of the present engines, pumping from the existing reservoirs, and will be finally completed in a few days. As the requisite parliamentary powers for our further extensions were only obtained in May, it has been impossible earlier to take the necessary steps for raising capital and constructing the additional works still required, but these works are now about to be commenced with energy, and the plans and specifications will be in the hands of the contractors for tender before the next monthly meeting of the board. The directors feel it to be a fair ground for congratulation that, notwithstanding the highly-increased and continued cost of every article of outlay, they have been enabled so far to avoid any increase of the present scale of water-rates, so low already in comparison with many other towns.

The CHAIRMAN, in moving the adoption of the report, said they happened to have present at that meeting Mr. Hawksley, their engineer, with whom the directors would have to confer at the close of the meeting, therefore he would not detain them with any lengthened observations. They would see by the report that so far as the receipts were concerned the state of the company was still satisfactory, and, with regard to payments, they were in the same difficulty as other corporations. Prices of labour and materials were exceedingly high. During the past half year they paid £730 more than during the corresponding period of last year for coal, bankers interest, and in dividend, the increase being divided as follows:—£317 extra for coal, £127 for bankers interest, and £285 in dividends. But, notwithstanding these drawbacks, they were still in the ascendant, and the surplus carried forward to the next half year was larger than any preceding one, except the last, and exceeded that of the corresponding period of last year by £150. But these were not the end of their expenditure. They were aware that they had been waiting for a greater amount of capital and greater parliamentary powers. Only about half the extensions it was proposed to make had yet been accomplished. It was the desire and determination of the board to carry out all their promises to the public; at the same time it was well for the shareholders to know that a very great outlay would be required. He believed about £33,000 had been expended during the nine years he had had the honour of being chairman of the board, and the directors who had hitherto borne the burden and heat of the day had the satisfaction of knowing that the last half year was not the worst. They believed that there were many hopeful signs for the future, and that the company would have an equally assured prosperity as it had had in the past. Of course they would have to dip more deeply into their reserve-fund, and it might be possible—though he did not think it would be probable for two years at any rate—that they would have to trench upon the dividend. But even if they did that they would have subsequent prosperity. In conclusion he moved the adoption of the report.

The Hon. W. M. JERVIS asked whether the directors had taken into consideration what capital they might possibly require under the Act of Parliament that was obtained in May last, and, if so, whether they had also considered in what way that would have to be raised. He also expressed himself satisfied with the carrying out of a proposal he made some time ago—viz., that the report should be printed and circulated amongst the shareholders some days before the meeting, and said that, although it might cause some inconvenience to the directors to prepare it so early, yet it saved time at the general meeting by furnishing the shareholders with particulars which they did not previously possess.

The CHAIRMAN said probably a little more than £32,000 would have to be expended, but it depended upon the degree of perfection to which they carried the works. Instead of the works thus proceeding by degrees, he should like the whole to be carried out so that they could boldly meet the emergency. As to the manner of raising the money, he should strongly recommend that there should be allotted amongst the shareholders a sufficient amount of capital. They had power to raise £10,000 by their borrowing powers; that would be spending £20,000 on share capital called up and £10,000 on borrowing powers. They might find it necessary to do as had been done in other towns—viz., to raise the rates for water. Certainly, if the price of coal and the price of labour continued high, they could not further guarantee to supply water at the present rates. The report stated that they took credit for having maintained the present scale of water-rates, but it was a question whether at some reasonably early date the scale should not be altered, but it was not improbable that the price would have to be raised in order that the dividends might keep pace with the great amount of interest on the additional outlay. They would bear in mind that all the interest on unremunerative capital—that large sum of £32,000 hitherto spent—had been paid out of revenue. It had been a very serious sum to raise, and there was no doubt that the further sum they had to raise would press severely upon the reserve-fund and a little upon the dividend.

The Hon. W. M. JERVIS asked if it was probable that they would require any of that capital before the next half-yearly meeting.

The CHAIRMAN: Certainly not.

In reply to other questions,

The CHAIRMAN said it was proposed to borrow £5000 on interest. They were paying 4 and 4½ per cent. interest. The outlay of the £32,000 included the production of more water, of which they had the benefit, but the great bulk of that sum was unremunerative. They had, however, met the interest on all that expenditure out of revenue, and it was this fact that made them so hopeful for the future. They were bound to provide the public with water, even though they made a slight sacrifice in the dividend—an event which was not probable.

Mr. BAKER seconded the adoption of the report, and the motion was carried.

Mr. GISBORNE then moved, and Mr. BAKER seconded—"That a dividend be and hereby is declared on the shares of this company of £1 5s. per share on the original shares, being at the rate of 10 per cent. per annum, free of

income-tax, and of 4s. 11¼d. per share on the new £12 10s. shares, being at the rate of 7 per cent. per annum on the amount paid on such shares, also free of income-tax, for the half year ending June 30, 1873, to be payable on the 1st of September next."

The resolution was agreed to, and on the motion of the Hon. W. M. JERVIS, seconded by Mr. BAKER, it was resolved—"That a further sum of £5000 be borrowed by this company on mortgage under the provisions of the Derby Water-Works Act, 1868, and that the board of directors are hereby authorized to borrow such sums and issue securities for the same under the seal of the company."

On the motion of the Hon. W. M. JERVIS, seconded by Mr. MARSDEN, a vote of thanks was passed to the directors and auditors.

The CHAIRMAN, in acknowledging the compliment, said the directors valued very highly this expression of confidence. They had worked laboriously, but had been most materially assisted by their eminent engineer, who had considerably lightened their labours. Many corporations and public bodies were pursuing what he would term a course of piracy by taking into their hands the works of companies who had expended their money on the faith of parliamentary guarantees. There was a growing feeling in favour of this course. If corporations proposed to take to the works in the moment of adversity, not very much could be said against the course; but when they proposed to take them in the time of prosperity, after the companies had expended time and labour in making them successful, he could not regard the course as anything else than a system of piracy.

Mr. WALLIS, on behalf of the auditors, also acknowledged the vote, and the meeting terminated.

METROPOLIS GAS SUPPLY.

Dr. Whitmore's report on the illuminating power, pressure, and quality of the coal gas consumed in the parish of Marylebone for the month of July is as follows:—

JULY, 1873.	Illuminating Power in Sperm Candles.			Mean Pressure in Tenths of an Inch.		Mean Quanty. of Sulphur in 100 Cu. Ft.	Mean Quanty. of Ammon. in 100 Cu. Ft.	Sulphuretted Hydrogn.
	*Mean of 24 Obser.	Highest.	Lowest.	Highest.	Lowest.	Grains.	Grains.	
Imperial Company's gas	16·20	17·30	15·21	25·42	10·21	19·65	0·46	None.
Chartered Company's common gas.	16·67	17·20	16·10	23·61	11·97	14·88	0·43	None.
Chartered Company's cannel gas	22·04	24·10	21·30	22·61	10·88	18·82	0·54	None.

Mean of daily readings of barometer . . . 29·83
" " " thermometer . . . 74·67

* Each observation consists of ten readings of the photometer, at intervals of one minute.

During the month the mean illuminating power of the Imperial Company's gas was equal to the light of 16·20 sperm candles; it ranged between 15·21 and 17·30 candles. The mean quantity of sulphur in 100 cubic feet was 19·65 grains, and of ammonia 0·46 of a grain. The mean illuminating power of the common gas of the Chartered Company was equal to 16·67 candles; it ranged between 16·10 and 17·20 candles; five times it exceeded 17 candles; the mean amount of sulphur was 14·88 grains, and of ammonia 0·43 of a grain. The mean light of the cannel gas was equal to 22 candles; it ranged between 21·30 and 24·10 candles. The amount of sulphur showed a mean of 18·22 grains, and of ammonia half a grain. The pressure of all the gases was good, and on no occasion was sulphuretted hydrogen detected in either of them by the ordinary tests. The above results were obtained from the common gas of the Chartered Company, manufactured at their Beckton and Bow works, and from the Imperial Company's gas, manufactured at their Fulham works.

METROPOLIS WATER SUPPLY.

Dr. Whitmore's report for July on the composition of the Thames companies and other waters is as follows:—

JULY, 1873.	Total Solid Matter in degrees or grains per Imperial gallon.		* Loss by incineration of Solid Matter in previous column.		Hardness before boiling in degrees.	Hardness after boiling in degrees.
	July, 1872.	July, 1873.	July, 1872.	July, 1873.		
Distilled Water . . .	0°	0°	0°	0°	0°	0°
West Middlesex water .	18·24	18·69	0·68	0·78	13·04	3·10
Grand Junction water. .	18·70	18·76	0·70	0·76	13·02	3·09

* The loss by incineration represents the amount of organic and other volatile matters contained in an Imperial gallon (70,000 grains) of water.

During the month the water supplied by both companies was perfectly clear and bright, and well filtered.

The following are the returns of the Association of Medical Officers of Health relating to the composition and quality of the metropolitan waters, in August, 1873:—

NAMES OF WATER COMPANIES.	Total Solid Matter per Gallon.	Oxygen required by Organic Matter, &c.	Nitrogen.		Hardness.	
			As Nitrates, &c.	As Ammonia.	Before Boiling.	After Boiling.
Thames Water Companies.	Grs.	Grs.	Grs.	Grs.	Degs.	Degs.
Grand Junction	...	...	...	...	...	...
West Middlesex	17·33	0·010	0·125	0·001	13·6	3·0
Southwark and Vauxhall . .	18·00	0·043	0·086	0·001	13·8	3·3
Chelsea	18·81	0·083	0·120	0·001	14·8	3·3
Lambeth	17·77	0·059	0·110	0·002	13·8	3·2
Other Companies.						
Kent	27·43	0·005	0·248	0·000	20·8	5·8
New River	17·63	0·026	0·098	0·000	14·0	2·6
East London	17·05	0·026	0·125	0·001	13·6	3·3

Note.—The amount of oxygen required to oxidize the organic matter, nitrites, &c., is determined by a standard solution of permanganate of potash acting for three hours; and in the case of the metropolitan waters the quantity of organic matter is about eight times the amount of oxygen required by it.

The water was found to be clear and nearly colourless in all cases but the following, when it was slightly turbid—namely, in that of the Lambeth, and the Southwark and Vauxhall Companies. The average quantity of water supplied daily to the metropolis during the preceding month was, according to the returns of the water companies to the Association of Medical Officers of Health, 126,144,369 gallons; and the number of houses supplied was 504,579. This is at the rate of 37·6 gallons per head of the population daily. The last official return from Paris stated that the average daily supply per head of the population was 24·9 gallons; but this includes the water used for the public fountains, and for the ornamental waters in the Bois de Vincennes and the Bois de Boulogne.

HY. LETHEBY, M.B.

The Registrar-General publishes the following returns furnished to him by the London water companies of the average daily quantity of water supplied during the month of July, 1873. According to their returns, 126,144,369 gallons, or 573,182 cubic mètres of water (equal to about as many tuns by measure, tons by weight), were supplied daily; or 250·0 gallons (113·6 decalitres), rather more than a ton by weight, to each house, and 35·2 gallons (16·0 decalitres) to each person.

According to the returns of the London water companies made to the select committee on East London Water Bills (session 1867), it is estimated that during the year 1866 about 82 per cent. of the total supply of water for all purposes was for domestic use: applying this proportion to the total quantity supplied daily in the month of July, 1873, it may be estimated that about 103,438,407 gallons were supplied for domestic purposes, or about 28·9 gallons per day for each inhabitant, against 27·8 in the corresponding month of last year. This proportion no doubt varies from month to month, but the Registrar-General has no means of giving a more exact estimate.

COMPANIES.	Number of Houses, &c., supplied in July, 1872.	July, 1873.	Aver. Daily Supply of Water in Gallons* during July, 1872.	July, 1873.
Total supply	497,845	504,579	119,736,251	126,144,369
From Thames	232,048	236,566	61,675,451	64,673,369
" Lea and other Sources . .	265,797	268,013	58,060,800	61,471,000
THAMES.				
Chelsea	28,154	28,270	9,024,100	9,063,460
West Middlesex	43,715	44,920	10,578,091	10,786,739
Southwark and Vauxhall . . .	78,917	79,438	16,457,669	18,962,041
Grand Junction	33,013	34,243	12,440,291	12,584,689
Lambeth	48,249	49,695	12,275,300	13,276,500
LEA AND OTHER SOURCES.				
New River	120,335	121,391	29,080,000	28,243,000
East London	104,196	104,481	21,405,800	25,782,000
Kent	41,266	42,141	7,575,000	7,446,000

* Including that for manufactures and for various purposes other than for domestic consumption.

Note.—The return for July, 1873, as compared with that for the corresponding month of 1872, shows an increase of 6734 houses, and of 6,408,118 gallons in the daily supply of water.

Dr. Frankland, F.R.S., reports that all the metropolitan waters were clear and transparent when drawn from the companies mains for analysis in August. Taking the amount of organic impurity contained in a given volume of the Kent Company's water as unity, the proportional amount in an equal volume of water supplied by each of the other metropolitan companies was:—New River, 1·4; East London, 2·6; Southwark, 2·7; West Middlesex and Grand Junction, 2·9; East London (from Finsbury Park), 3·2; Chelsea, 3·4; and Lambeth, 3·7. The temperature of the Kent Company's water was 57·2° Fahr.; that of the waters drawn from the mains of the other companies ranged from 64·9° to 68·9°. The quality of the Thames water was not quite so good as in July; it is of the utmost importance that the present efficient filtration should be continued. The East London Company now takes a portion of its supply from the Thames at Sunbury, whence, after filtration, it is conveyed through a long main to the East of London; the water, when analyzed on its arrival at Finsbury, was found to have suffered no deterioration in transit.

TESTIMONIAL TO MR. JOHN STORER, OF STAFFORD.—The directors of the Stafford Gas Company, desirous of evincing their high appreciation of the long and valued services of their respected secretary and manager, Mr. John Storer, took the opportunity, at their ordinary monthly meeting, on Wednesday last, to present him with a testimonial, consisting of a handsome bronze timepiece and two bronze vases of the value of 50 guineas. Upon the timepiece the following inscription was engraved:—"Presented to Mr. John Storer, by the directors of the Stafford Gas Company, as a tribute of respect for his valuable services as manager and secretary for upwards of 18 years. Stafford, September 3, 1873. Thomas Turner, Chairman." The board-room had been tastefully decorated, and a substantial luncheon prepared for the occasion. The chairman, Mr. Thomas Turner, presided, and there were also present the vice-chairman, Mr. J. Talbot; Major Johnson, and Messrs. H. W. Gibson, G. F. Griffin, J. Kenderdine, and W. Bowen, directors; Mr. J. Pilling, treasurer; and the Rev. T. S. Chalmers and Mr. J. Nevitt, auditors. The chairman, in making the presentation, spoke of the great pleasure it afforded the directors to recognize in a substantial manner the long and valued services of their worthy secretary and manager, who had, during the period of 18 years, devoted his best energies to the development of the company's resources, and had introduced every desirable improvement into the apparatus for the manufacture of gas, so that it would bear comparison with any other gas-works. He was the better able to say this from having lately visited one of the largest gas-works in the kingdom. He expressed a strong hope that Mr. Storer might be spared to them for many years to continue the successful management of the company. Mr. Storer very feelingly responded. He observed that the directors handsome present was the more valuable because it was presented at a time when they had a claim upon his services for several years, and not as was usually the case, when the recipient was leaving a situation to accept a more lucrative appointment. Various toasts having been proposed and responded to, the meeting separated.

THE NEW PENNSYLVANIAN OIL-WELLS.—Speaking of the eight large wells recently struck on the Star and Troutmann farms, which are represented to exceed in average production anything known within so limited an area since the early days of Pithole, the *Titusville Herald* says:—"The first of these wells is the Troutmann, struck last spring, which started up at about 600 barrels, and is now doing about 450. There are now seven other wells in this immediate vicinity, doing respectively all the way from 500 to 1300 barrels per day. There are 74 more wells now going down in this vicinity, within a radius of about a quarter to half a mile, which will be finished within the next 30 days. The best informed judges place the present production of the region at 30,000 barrels per day. The excess is being rapidly bought up at low figures by speculators, who believe that a reaction must eventually ensue. It is highly probable that oil will be very cheap for some time, but how cheap no one can tell. The pool of oil which has been struck will, owing to the large number of wells sunk over it, unquestionably, like its predecessors, become rapidly exhausted, and the low price will discourage new developments, and have a tendency to shut down many of the smaller wells. Meanwhile the heavy shipments of cheap oil to Europe will open up new channels of trade. The demand will in future be increased in proportion, and a reaction, with high prices, will, judging from past experience, not diminish the demand. China and Japan are now taking considerable oil, and this trade, which is comparatively new, can be pushed to an almost unlimited extent. The present sudden and unlooked-for increase of our product, with resultant low prices, will therefore, in the long run, be likely to prove advantageous to the interests of the region.

BRIGHTON PUBLIC LIGHTING.

A Meeting of the Brighton Town Council was held on Monday, Aug. 25—the Mayor (Alderman IRELAND) in the chair—the most important business being to "receive a report from the gas committee with reference to the contracts with the two gas companies for the supply of gas to the public lamps in the borough, and as to the effect of certain provisions of the Hove Gas Company's new Act of Parliament; and to adopt resolutions thereon."

The following is the report referred to:—

The gas committee report that their chairman (Councillor Bastick), Mr. Freeman (solicitor), the surveyor, the chief clerk, and the corporation gas analyst, have had interviews with the superintendents of the two gas companies with a view of arranging terms for new contracts, should the Hove Company decide on putting an end to the existing contract with them, by exercising the discretionary power given them by section 3 of their new Act of Parliament: that, at the interview with Mr. Paddon, the superintendent of the Hove Company, Mr. Paddon stated that he considered the company were entitled to charge, and that they intended to charge, the increased price of 4s. per 1000 cubic feet for the gas supplied by them from the 8th of July last, the day after the date of the passing of their Act, but that, otherwise, he considered the contract between the company and the corporation to be still in force, and that the company would not make any alteration as to the number of hours the lamps are kept burning, or the quantity of gas consumed, until they received a request from the Town Council to do so.

The committee have also, since the interview referred to, received the following letter from Messrs Clarke and Howlett, the solicitors to the Hove Company:—

"8, *Ship Street, Brighton, Aug.* 20, 1873.

"Dear Sir,—Mr. Paddon informs us that some question was raised before your committee as to the price for gas the corporation are to pay the Brighton and Hove Gas Company since the passing of their Act of the late session of Parliament.

"There can be no doubt that the corporation will have to pay the company for all gas supplied to them since the passing of the Act at the rate of 4s. per 1000 cubic feet; and, with the view of ascertaining the quantity, the register of the meters was taken on the 8th of July last, the day after the royal assent.

(Signed) "CLARKE AND HOWLETT.

"David Black, Esq., Town-Clerk."

The committee dispute the correctness of the view taken by the Hove Gas Company and their solicitors of the effect of section 3 of their new Act of Parliament, and deny the liability of the corporation to pay the increased price without notice from the company. In the opinion of the committee, the section referred to gives the company the option of putting an end to the existing contract with the corporation, by giving notice of their intention to charge an increased price of not exceeding 6d. per 1000 cubic feet of gas, and that, on their giving such notice (but not otherwise), the corporation would be released from their liability under the contract to take 5 cubic feet of gas per hour for 3842½ hours per annum for each public lamp, and be at liberty to exercise the power given them by section 9 of the new Act to call upon the company to supply the public lamps with any smaller quantity of gas, not being less than 15,000 cubic feet per annum for each lamp.

The committee recommend that, without prejudice to the question as to the price the corporation are liable to pay for gas supplied after the date of the passing of the Act, until the company shall give notice of their intention to exercise the discretionary power given them by section 3, the company be informed that, should they decide on charging the extra 6d. per 1000 cubic feet, or any part of that sum, for gas to be supplied in future to the public lamps, the corporation will require the company to supply the lamps (at the cost of the corporation) with new burners to consume 4 cubic feet of gas per hour, and to light and extinguish the lamps at the hours mentioned in the schedule appended hereto, by which means the consumption of gas will be reduced to the 15,000 cubic feet per lamp per annum in accordance with section 8 of the company's new Act.

The committee also recommend that a communication be made to the Black Rock Gas Company, offering to vary the terms of the existing contract with that company by increasing the price to be paid by the corporation for gas supplied to the lamps within the Eastern district of the borough to the same price as the Hove Company charge, and substituting the new burner described in the Hove Company's Act of 1873, for the burner at present used in testing the illuminating power of gas; on condition that the Black Rock Company agree to the adoption of the new burner (made to consume 4 feet of gas per hour) for the lamps, and the new schedule of hours for lighting and extinguishing, and also agree to supply with gas, and clean, light, and extinguish such public lamps as the corporation may require in the parish of Preston (after the extension of the borough on the 1st of November next) at the same price and upon the same terms and conditions as the lamps in Brighton.—On behalf of the committee,

Aug. 21, 1873. (Signed) SAMUEL BASTICK, Chairman.

The new Schedule of Times for Lighting and Extinguishing the Lamps referred to in the above Report.

Week Ending	Light. p.m.	Extinguish. a.m.	No. of Hours Burning per Lamp per Night.	No. of Hours Burning per Lamp per Week.
	H. M.	H. M.	H. M.	H. M.
January 7	4 18	7 43	15 25	107 55
„ 14	4 27	7 35	15 8	105 56
„ 21	4 38	7 25	14 47	103 29
„ 28	4 50	7 20	14 30	101 30
February 4	5 4	7 11	14 7	98 49
„ 11	5 15	6 29	13 14	92 38
„ 18	5 28	6 16	12 48	89 36
„ 25	5 41	6 2	12 21	86 27
March 4	5 55	5 47	11 52	83 4
„ 11	6 6	5 32	11 26	80 2
„ 18	6 28	5 16	10 48	75 36
„ 25	6 40	5 0	10 20	72 20
April 1	6 50	4 45	9 55	69 25
„ 8	7 3	4 28	9 25	65 55
„ 15	7 15	4 13	8 58	62 46
„ 22	7 26	3 28	8 2	56 14
„ 29	7 38	3 14	7 36	53 12
May 6	7 54	3 0	7 6	49 42
„ 13	8 5	2 48	6 43	47 1
„ 20	8 15	2 37	6 22	44 34
„ 27	8 26	2 28	6 2	42 14
June 3	8 34	2 51	6 17	43 59
„ 10	8 45	1 47	5 2	35 14
„ 17	8 51	1 44	4 53	34 11
„ 24	8 53	1 44	4 51	33 57
July 1	8 54	1 52	4 58	34 46
„ 8	8 51	1 57	5 6	35 42
„ 15	8 46	1 58	5 12	36 24
„ 22	8 40	2 36	5 56	41 32
„ 29	8 25	2 46	6 21	44 27
August 5	8 15	2 57	6 42	46 54
„ 12	8 2	3 7	7 5	49 35
„ 19	7 49	3 18	7 29	52 23
„ 26	7 34	3 29	7 55	55 25
September 2	7 14	3 40	8 26	59 2
„ 9	6 59	4 22	9 23	65 41
„ 16	6 44	4 33	9 51	68 57
„ 23	6 26	4 44	10 18	72 6
„ 30	6 10	4 55	10 45	75 15
October 7	5 54	5 7	11 13	78 31
„ 14	5 39	5 18	11 39	81 33
„ 21	5 14	5 31	12 17	85 59
„ 28	5 0	5 43	12 43	89 1
November 4	4 45	5 54	13 9	92 3
„ 11	4 34	6 8	13 34	94 58
„ 18	4 24	6 20	13 56	97 32
„ 25	4 15	7 2	14 47	103 29
December 2	4 14	7 13	14 59	104 53
„ 9	4 5	7 22	15 17	106 59
„ 16	4 4	7 30	15 26	108 2
„ 23	4 5	7 35	15 30	108 30
„ 30	4 9	7 43	15 34	108 58
And on the 31st	4 11	7 48	15 37	15 37
			549 6	3750 0

The report having been received and ordered to be entered on the minutes, The CLERK said that, since the report had been sent out, there had been some correspondence between the solicitor to the gas company (Mr. Somers Clarke) and Mr. Freeman, which he had better read.

The letters were read. Mr. Clarke, in a communication dated the 20th of August, gave the corporation, through the clerk, "express notice" that the price of gas to the corporation would be raised to 4s. per 1000 cubic feet from the 8th of July last—the date after the passing of the Act. Mr. Freeman wrote denying the right of the gas company to make the increased price apply retrospectively, and stated that the new arrangement could only be held to apply from the date of the receipt of the notice.

Alderman ALGER asked whether the notice to increase the price of gas could be held to apply retrospectively.

Mr. FREEMAN (acting town-clerk) replied that his opinion was in the negative.

Mr. BASTICK then moved a formal resolution for carrying out the recommendations contained in the Gas Committee's report. He said that the gas company construed their powers differently to the legal advisers of the corporation, and asserted that they could avail themselves of a clause in their newly passed Act giving them authority to charge 6d. extra per 1000 cubic feet, while, at the same time, the other provisions of the existing contract with the corporation would remain in full force. Thus, the company argued that a portion of the contract was determined by the Act of Parliament, while the remaining portion was left intact. This arrangement seemed most unusual; but whether the Act of Parliament empowered the company to do so was a question which he could not decide, the legal gentlemen being at variance respecting it. The Gas Committee would only at present advise that different burners should be substituted, so that the lamps should burn only 4 cubic feet per hour. A number of these burners had been already put up by way of experiment, and, unless any one was told, he did not believe they could distinguish the slightest difference between the light obtained through the new burners and the old ones. An arrangement was also proposed by which the corporation would consume 15,000 cubic feet per gas-lamp per annum. Under the old Act and under the contract they were required to burn 25,000 cubic feet per lamp per annum. Besides changing the burner, an alteration would be made in the lighting and extinguishing of the lamps. This, he thought, could very well be done to the advantage of the corporation and without any disadvantage to the public. At present, he thought, the lamps were lighted too early in many parts of the town, and in others they were not extinguished till some time after they had been rendered unnecessary. With regard to the last paragraph in the report, it must be obvious to all that it was desirable, if the corporation came to an arrangement with the Hove Company, they should also make a similar arrangement with the Black Rock Company. As regarded the difference in price which the Black Rock Company had power to charge for gas, he (Mr. Bastick) thought that was a question which might be satisfactorily arranged. While upon this subject, he should like to refer to one other matter. They were all aware that, for some time past, they had been paying, as a corporation, the same price for gas as did any private consumer. They had now received notice from the Hove Gas Company that they intended to charge the corporation the maximum price for gas, notwithstanding the council were their largest consumers. The corporation had entered into a contract with the company, and they laboured under disadvantages which private consumers did not. A private consumer, burning only 5000 cubic feet per annum, had absolute control over his gas supply; while the corporation, as large consumers, were encumbered with restrictions, and had to pay the same amount for their gas. This being so, he did not think the corporation were placed on a fair footing. For himself, he could scarcely see that a contract was necessary. He thought the company's Act gave the corporation all the power they needed; because, if the corporation paid the company the maximum price for the gas, they were bound to supply it; and, if there were no contract, then the council could take the matter of lighting and extinguishing into their own hands, and might thus effect a saving. The council would be unfettered by the covenants of a contract, and have full and complete control over their gas supply. The committee were told that such a system was in existence in several towns, and that it had been found to work beneficially and advantageously. He was sure, therefore, that the matter was one worth the consideration of the council, and he hoped that attention would be given to it. Moreover, he did not think the companies would object to such an arrangement.

Mr. NEWMAN seconded the motion. He said that, according to the view taken by the corporation solicitor, their contract with the gas company was at an end, and he thought they should be on their guard against entering into a further contract. Gas was, he believed, as yet in its infancy, and the time might come when it would be manufactured by other means than from coal, and when it would be much cheaper. The increase in the charge for gas would involve an extra payment by the council of something like £20 a week.

Mr. REEVES called attention to the fact that, although the Black Rock Company had given notice to increase the price of gas to 4s. per 1000 cubic feet, yet, as he understood, that company would supply gas of a greater candle power than the Hove Company would do under their new Act. Therefore, he suggested, as a point for consideration, the desirability of permitting the Black Rock Company to supply the whole town; and also whether they should not hold that company to their contract to supply 16-candle gas.

Mr. NEWMAN said, if they did this, they would be compelled to burn 5000 cubic feet of gas per lamp per year in addition to what they proposed to do under the new arrangement.

Mr. BASTICK said he had no reason to doubt but that the Hove Company would accede to the use of a different burner.

Alderman ALGER referred to the water gas experiments at Chichester, and thought it would be well if the committee were to make inquiries there so as to be able to give some information on the subject. As to the report, he remarked that, at a certain period of the year, it was proposed to extinguish the public lamps at half-past one o'clock in the morning; but, inasmuch as in the very heart of summer it was quite dark at that hour, he thought the figures required some revising.

At this stage of the proceedings the council was adjourned before any decision on the motion was arrived at.

BERLIN WATER-WORKS COMPANY, LIMITED.—An extraordinary general meeting of proprietors is convened for Friday next, the 12th inst., for the purpose of considering, and, if deemed expedient, of confirming the following resolution, passed at the extraordinary general meeting of proprietors of shares in the company held on Aug. 26, 1873, namely—"That the board of directors of the company be and are hereby authorized to enter into and carry into effect on behalf of the company a contract with the municipality of Berlin for the sale to the municipality of the works, property, and undertaking of the company, on such terms and conditions as the board of directors shall think proper; and the directors are hereby empowered to appoint an attorney or representative to act for them and the company in Prussia in entering into and carrying into effect any such contract, and to delegate to their said attorney or representative all or any of the powers and authorities of the board of directors in relation thereto, including authority to sign and seal any contract or contracts in the name and on behalf of the company." The terms upon which the undertaking is to be transferred were stated by the chairman at the ordinary meeting of the company on Aug. 5, as reported in the JOURNAL of the 12th ult.

HEREFORD (CORPORATION) GAS SUPPLY.

A Meeting of the Town Council of Hereford was held on Tuesday, Aug. 19—the MAYOR presiding—at which the Gas Management Committee presented the following report for the past year, submitted to them by their manager, Mr. William Davies:—

Gentlemen,—I have the honour to lay before you the following report upon the working of this department for the year ending the 30th of June, and the first year of your possessing these works. In doing so I am unable to make a full and fair comparison with former years, not having the late company's books in my possession. You will, however, observe by the annexed balance-sheet and statistics that, nothwithstanding your coals having cost you upon an average 19s. 8d. per ton, as against 11s. 0½d., the average cost per ton to the late company during their last year of occupation, the profits actually made are sufficient to pay the interest upon the £55,000 borrowed for the purchase of the works, and leave a balance of £536 4s. 11d. towards paying the first instalment on account of principal due on the 2nd inst. The quantity of gas produced during the year has been 45,898,000 cubic feet, as against 46,027,000 feet made the year previous. The quantity of coals carbonized, 4457 tons 17 cwt. 2 qrs., as against 4545 tons 13 cwt. 1 qr., and the average production per ton of coal, 10,295 cubic feet, as against 10,125 cubic feet, showing a considerable improvement upon the last year's working. This large production per ton I cannot hope to maintain in the future; your retorts having been quite new has enabled us to pass to the holders the whole of the gas contained in the coal. The lost or unaccounted-for gas during the past year amounts to 6,452,000 cubic feet, or 14·04 per cent. of the quantity delivered, as against 11·53 per cent. lost the year previous. This increase is doubtless owing in a great measure to the increased working pressure put on at your request in November last. The maximum quantity of gas delivered in the 24 hours was 259,000 feet on the 21st of December last, and the greatest production 246,000 cubic feet. This is by far the largest production ever made at these works, and did not fail to show our weak points. I had very great difficulty in passing the gas to the holders, in consequence of the intermediate plant being too small for such a large production; in fact, upon several occasions we were in great danger. This we cannot remedy for the coming winter, but the necessary steps must be taken to make the alterations during next summer. The late company were well aware of this, and were prepared to have made a portion of the alterations before this time had the works remained in their hands. It was also their intention to increase the gas storeage room by telescoping the large holder. In the depth of winter we feel the want of increased storeage room very much, and it will be necessary for you to take into consideration some plan for the increase of this part of your plant.

Gas Office, July 30, 1873. (Signed) WILLIAM DAVIES, Manager.

Mr. GARROLD, in moving the adoption of the Gas Committee's report, which embodied their financial statement, said some questions had been asked as to the probable expenditure in carrying out the improvements contemplated by the committee. Necessarily that expenditure would be very considerable, perhaps over £2000, but it must be satisfactory to know that those improvements were necessary by the corporation as owners of the gas-works having an increased business. Looking at the matter as a commercial speculation, it was quite clear that any improvements that would enable them to carry out a better and more profitable business must be to their advantage as representatives of the ratepayers of the city. He had no doubt that before long a report would be brought up on the subject. It was necessary that the money for improvements should be laid out next year, and the committee would have to apply to the council for that purpose. At present, however, the matter was not before the council, nor was it worth while now discussing it. The committee themselves had not as yet decided anything upon it. It would be time enough for the council to consider the subject when a report from the committee was brought before them. It must be satisfactory to the citizens to know that, having spent a large sum of money upon the purchase of the works, the committee had been able to carry them on for a year without at all increasing the cost of the gas supplied, to pay the interest upon the money borrowed for the purchase of the works, and to have a balance in hand of £500 or £600 besides. Sometimes people out of doors who did not understand the subject had said they had not to thank the corporation for keeping down the price of gas. His (Mr. Garrold's) impression was that if the people of Hereford had during the past year received no other benefit from the purchase of the gas-works, they had received the benefit of the price being kept down to 4s., instead of being raised to 4s. 6d. and even 5s., as had the price of gas supplied by other companies in the kingdom, in consequence of the greatly increased price of coal. For that the citizens had to thank the corporation, and he hoped and fully expected they would still be able to carry on the works successfully at the present price.

Mr. GWYNNE JAMES said that he was sorry he could not concur in the proposal to receive the report of the committee as it stood. It was accompanied by various accounts and statements to which he must call attention. The first account was a capital account, in which the committee had charged two items as having been expended on account of capital, and as he had confidence in the committee as men of business, he must give them credit for knowing when an item should be charged to capital and when to revenue, and therefore he should assume that account to be correct; although, as a matter of fact, they in a subsequent account debited the same two items over again to revenue. This account showed a balance of £1410 due to capital. The next statement was called "Gas and Fittings Account." What that was intended to represent he had, after the fullest consideration, been unable to find out; but, whatever the intentions of the committee may have been upon the subject, he undertook to say that the result was simply a chaos of figures. This account commenced with a debt of £880 as the value of the floating stock at the commencement of the year, but if they looked at the other side of the account they would look in vain for any item of credit representing the value of the floating stock at the end of the year. He should like to know what any man of business would say to a trade account which debited the concern with the stock-in-trade at the beginning of the year, but omitted to take credit for the stock in hand at the end of the year. Then, again, in this account they took credit for £7463 as cash received for gas sold, but they wholly omitted the item of £1667, which they said was due to them for gas and other articles sold. And here he would put a similar question—What was to be said of a trade account which took credit for the cash received over the counter, but omitted the book debts? That this account was an absurdity was clear from this fact. It included gas, fittings, and residual products—all their branches of business—and only showed a profit of £956; yet, in a subsequent statement, they claimed to have made upwards of £3000 profit. Now would the committee explain where the other £2000 came from, if it did not come from gas, or fittings, or residual products? The next account was a cash account, in which appeared an item for interest paid. If they looked lower down the sheet they would find the same item appeared in another statement, but that it was a different amount. Mr. Davies had explained to him that in the one case income-tax had been deducted, and in the other it had not. He would not discuss which of the two amounts was right, but it was obvious that one must be wrong. The next statement they were favoured with was called a revenue account, and they would find in it the following item, "Balance due *from* capital account." Now, in the first place, there was no balance due *from* capital account, as it happened to be due *to* capital account. But, in the name of common sense and Cocker, he would ask, what could any balance due from or to capital account have to do with a revenue account? For his own information he had made out a statement based upon the figures furnished by the committee. This contained a capital account, profit and loss account, and a balance-sheet. He begged to lay it before them, and they would see from it that, if the figures of the committee were correct, the gross profit was in fact more than £200 in excess of that stated by the committee. The difference arose from the fact which he had already mentioned—that the committee had charged two of their items of expenditure, firstly to capital and then a second time to revenue. He thought he had stated quite sufficient to show that these accounts required much alteration; but there was an additional fact which, although he had no doubt it admitted of explanation, most certainly required to be explained. The manager, in a schedule to his report, said that they had sold 38,745,600 feet of gas, *and no more*. This at 4s. per 1000 (and for the first quarter of this year they sold their gas at 3s. 6d.) would only produce £7749. Yet in their accounts they said that the total received and due for gas was £8819. Now was this possible? It was very important that these accounts should be accurately made out, because there was a serious question behind them. The profits realized would not pay the whole instalment of the purchase-money, and the present deficiency would, as the manager had warned them, increase. How was the admitted deficiency to be met? It might be met in two ways—by raising the price of gas or by payments out of the rates. He had expressed an opinion that these works must be made self-supporting, and that there must be no taxation to carry them on; and Mr. Garrold and other members of the council had said the same thing. But upon consideration he doubted whether that opinion was right. They had two classes of ratepayers, one who did consume gas, and one who did not; and at the end of 30 years, when the works were paid for, they would become the property of both classes. Perhaps, therefore, it would not be quite just to call upon the one class—the consumers of gas—to pay the whole purchase-money through the price of their gas, and he thought no wrong would be done if the non-consumers were made to contribute something by means of rates. This question, however, had not before been submitted to the council, and he invited them to consider it before the next meeting, when he hoped they would have a correct set of accounts before them, and a decision must be come to. He proposed "That the report of the Gas Management Committee be referred to them with the request that they will reconsider, and if necessary remodel the accounts and statements annexed thereto, and that the committee have power to employ a professional accountant for the purpose."

Mr. GARROLD said as far as he was concerned he should be very glad to see the proposal of Mr. James put into the report. He was puzzled with the accounts, and could not understand them. He had, therefore, attempted to induce the committee to do what was now proposed and to have the accounts set right by a professional accountant. He gave notice at the last meeting that he should move a resolution that day asking the council to sanction the appointment of an accountant. He quite agreed that it was highly essential this first year that they should have a clear and safe basis on which to start. They had at the present time a very good manager and a good staff, in whom they had every confidence. There was no doubt that their confidence was well placed. They might get dishonest people at some future time, however, and it was highly important that they should have a stranger coming occasionally who should look carefully into things. If he was right in doing so he would be glad to withdraw his motion and second that of Mr. James.

Mr. RALPH said he had no doubt the manager would explain to them that he followed the example of the old company. The old company had no very particular wish that the exact state of their accounts should be shown, because if the great profits that they were making had been known it would have caused a great stir in the town.

Alderman ANTHONY remarked that so far from their being anything wrong, Mr. James had shown that the committee had omitted to put down a sum of £200 to their own credit.

The MAYOR said it was satisfactory to know that the gas-works were more profitable than the manager had anticipated.

Mr. DAVIES explained that he had had some difficulties to contend with from the first. He was not supplied with the proper figures with respect to the purchase of the works, and he had a credit gas and fitting account. Properly that should be two separate accounts, and should show the actual profits. There were two sums handed over to him to take into account—one of £360 and another of £520. The £360 was for stores and fittings; the second was given for stores, coal, tar, lime, fitter's shop, service-pipes, and other things, which were part and parcel of the fitting stock. It was impossible for him to divide them to ascertain accurately what should go to the fitting account and what should go to the gas-making account. With regard to the capital account, they said it should be in a more condensed form, but they really had no capital account.

Mr. GARROLD withdrew his motion, and the report was adopted with the amendment proposed by Mr. Gwynne James.

RICHMOND (SURREY) GAS COMPANY.—The half-yearly meeting of shareholders was held at the Greyhound Hotel, on Thursday, Aug. 28—Mr. W. Chapman in the chair. The revenue account was read, and a dividend of 4 per cent. on old, and £2 16s. per cent. on new shares, was declared.

LIVERPOOL WATER SUPPLY.—At the meeting of the Liverpool Water and Baths Committee, on the 25th ult., the chairman (Mr. J. H. Wilson) said he wished to call the attention of the committee to the state of the water supply. He said that in February this year they began with the whole of the reservoirs overflowing. Shortly afterwards they obtained water from Dunmow Lane, and for 1873 they had they had the full use of all their resources. However, from prudential motives they had to put the town upon a short supply, and they had also shortened the supply for the out-townships, and refused to supply water in any case where it was not obligatory. They had gone to the full length of the capacity of the water supply. In seven years hence—for it would be impossible to go for an additional scheme before 1875—their position in 1880 would be that they should have such an increase each year, in the demand that that they would require 25 per cent., or 4,000,000 gallons more per diem than at present. The revenue of the water committee was now £160,000 per annum; in 1890 it would be found to be £200,000. But they had now to consider what would keep the town going from 1873 to 1880. The only new works in progress was the new reservoir at Rivington, which would be completed next year; and until next year the new pipe line would not be available. They had more than 87,000,000 gallons a week which could not be brought by the present pipe line; but steps were being taken to meet the various requirements. They had taken measures to prevent waste of water, and he hoped that they would be able to obtain from the waste sufficient water to meet the deficiency to the year 1880. He mentioned that they were laying the new pipes in the lower parts of the town at such a depth that they would be free from the effects of frost. New stand-pipes were being erected in courts, which would give a copious supply night and day. In the old time, working men were compelled, when they came home at night from their work, to drink water taken from a small tub, the water sometimes being covered with soot, and open to all the gases in the neighbourhood. But now, under the present system, the water was kept very fairly cold during the summer; and he was sure that to have a constant service of water would help to do away with drunkenness. There was one difficulty in the way of obtaining plenty of water, and that was the difficulty of choosing a better scheme. Every year the matter was delayed made it more difficult to be dealt with. New railways were being constructed or proposed; they followed the course of the valleys, and it was found that some most eligible sites for obtaining water were being taken in this way; other lorge towns were also going in for more water, which made it the more difficult to obtain good sites. In reference to the bearing of the expense, he mentioned that at present the ratepayers of Liverpool paid 1s. 4d. in the pound, while those in the outlying districts paid 9d. In Liverpool they had enough of water; they had spent considerable sums upon Bootle and Green Lane, and a quarter of a million at Rivington, and this was done for the out-townships. He thought, therefore, that the first step that should be taken would be to make every part pay share and share alike.

DUBLIN ALLIANCE AND CONSUMERS GAS COMPANY.

OPPOSITION OF THE CORPORATION TO THE PROPOSED ADVANCE IN THE PRICE OF GAS.

The Dublin Alliance and Consumers Gas Company having issued notices on the 22nd ult., stating their intention to apply to the Board of Trade, under the "Gas and Water Facilities Acts, 1870 and 1873," to increase the price now charged for gas to the consumers of the city of Dublin and the surrounding townships, a special meeting of the Town Council was convened, by requisition, on Friday, the 29th, to consider such notice, "and to do or cause or direct to be done all necessary acts thereupon as the council may then determine." The chair was occupied by the LORD MAYOR, and the proceedings were opened by

Mr. BYRNE, who said, as one of the requisitionists, he would take the liberty of laying before the house his views upon the question. When the Dublin Corporation Gas Bill was promoted last session he stated that a bill was at the time in its passage through Parliament which would enable gas companies, not only in England and Scotland, but in Ireland, to go before the Board of Trade in the manner referred to in the requisition; that the bill received the Royal Assent on the 5th of this month, and the gas company were now before the Board of Trade with an application to increase the price of gas. That increase would apply to private consumers as well as to the corporation for the public lights. Some five or six years ago the corporation paid £12,000 a year to the gas company for the lighting of the public lamps, when there were fewer than at present, and now they paid about £8000, the saving having been effected by the new arrangement suggested by No. 1 Committee, and carried out by Mr. Cotton, assisted by some members of the committee, and they were now in danger of losing that advantage in consequence of this Act of Parliament. This fixed the consumers of gas with all the shortcomings of the management of the gas company, no matter how improvident or careless they might be, for if they could show by their books that they are paying their shareholders less than 5 per cent., or the statutable dividend, they can get an order from the Board of Trade, to last for two years, to increase the price of gas to such a sum as would enable them to pay that dividend. That was one of the reasons which induced him to ask the council to take into their hands the undertaking of the Alliance Gas Company, because they would be always liable to these demands for increase without having any control in the management of the concern. This application, he believed, would be acceded to unless persons who are interested lodge petitions against it with the Board of Trade. The gas company would endeavour, he presumed, to show by their books that the application ought to be acceded to; but he believed the report of the engineers who examined the works and machinery would show that, with average management, the gas company ought to be able to pay their shareholders the statutable dividend of 10 per cent. If they could make only 8000 cubic feet of gas out of a ton of coals when every other company in the empire made 10,000 feet, and if the leakage, which meant gas unaccounted for, amounted to 30 per cent., when in no other gas-works in the kingdom did it amount to more than 14 per cent., and if these facts were laid properly before the Board of Trade, he did not think they would accede to the application. He was not prepared to say that if the management was all that could be desired, and if the shareholders could not realize 5 per cent. on the invested capital, the directors would not be entitled to ask the increase; but the case was quite different when the evidence showed that if it was managed as other companies in the country are it would not only pay the shareholders 10 per cent., but the profits realized over and above that would lead to a reduction in the price of gas. He concluded by moving the following resolution—"That the corporation has read with much surprise the notice referred to in the requisition convening this meeting; that the reports and evidence of the several eminent gas engineers, which have been printed by the House of Commons, as part of the proceedings before the committee of that House upon the Dublin Corporation Gas Bill, 1873, and the report issued by the committee of shareholders, fully warrant us in assuming that if the affairs, business, and management of the Alliance and Consumers Gas Company were conducted and carried on with average care, prudence, and skill, a fair and highly remunerative dividend would not only result to the shareholders, but, under the statutes of the kingdom, a reduction in the price of gas should be made to the consumers; that John Smith, Esq., the law agent, in the event of the company proceeding under said notice, be therefore hereby directed to prepare and lodge with the Board of Trade the objections of this corporation to the application of the said gas company, set forth in said notice, or any part thereof, being complied with, giving the said evidence and reports above mentioned as reasons, amongst others, upon which the objections are founded; and that he be hereby authorized to appear by counsel upon any inquiry deemed necessary by or desired by the Board of Trade in this matter, as also in the preparation of the said objections, and that the same when prepared and engrossed under the direction of the No. 1 Committee shall have attached thereto the city seal (which attachment the town-clerk is hereby authorized to make), and shall be duly lodged with the Board of Trade within the proper limit by the said law agent."

Mr. MURPHY seconded the resolution. He thought they were bound to do everything to protect the interests of the ratepayers in the matter. If the proprietors of the gas company did not receive a fair remuneration from their works, he could not object to their seeking to gain it by every legitimate means, but it was proved beyond all question that they were capable of getting it if the concern was properly managed. Under these circumstances, he did not see why the property of the ratepayers should be laid under further contribution.

Mr. VEREKER had no objection to the course proposed being adopted, but he could not pledge himself to the statements in the resolution, which substantially amounted to this, that the gas-works were in a perfectly sound and satisfactory condition. He moved an amendment that the law agent be simply instructed to oppose the application.

Mr. DENNEHY seconded the amendment.

Mr. BYRNE did not consider that Mr. Vereker's proposition was an amendment, for it was the same as the motion.

Alderman REDMOND said it struck him that if they were to go before the Board of Trade to raise a point they must be prepared with their reasons to sustain it. The gas company must prove that in their management they used all skill and diligence, and produced as good an article as could consistently be done, and the case of the corporation must depend on their disproving that; for if the company did everything they could, the corporation had no business to go before the Board of Trade.

The LORD MAYOR decided that the amendment was out of order.

Mr. VEREKER then moved as an amendment—"That all the resolution of Mr. Byrne, with the exception of the first word, be omitted, and the following words substituted, viz.: 'That the law agent be authorized to take the necessary steps to oppose the application to the Board of Trade by the Alliance Gas Company.'"

Alderman M'SWINEY seconded the amendment.

Mr. DENNEHY supported it. He altogether differed from Alderman Redmond. He did not think they would be justified in going before the public with a statement in reference to this objection until they knew what the application was to be. The gas company were bound to make a case as plain as a case could be before the Board of Trade would be warranted in giving them the permission which they asked; but as yet they did not know what statement they would make, or what reasons they had for making the application.

Mr. BYRNE said the basis of their objection was the opinions of the engineers and the evidence given in the late inquiry, which the amendment proposed should be left out. They might as well try to build a superstructure on air as go before the Board of Trade without the law agent having his statement ready. In this matter they could not omit their duty to their constituents, to whom, independent of the £4000 to the corporation, it involved a sum of £52,000 a year. He could not alter a word of the resolution, for the matter they wanted to strike out was the very corner-stone of their case.

The amendment was put, and lost.

Mr. VEREKER, however, submitted another amendment, viz.:—"That the law agent is hereby directed to appear to oppose the application of the Alliance Gas Company to the Board of Trade, and do prepare and lodge a proper objection thereto, as prescribed by Act of Parliament." He repudiated the idea that he was supporting the gas company, and said, on the contrary, he protested against the gas company carrying this resolution before the Board of Trade; but he considered the objections should be stated in a petition of the law agent, and not in a resolution of the corporation which contained statements they might not all indorse, and, perhaps, could not support, which might hereafter be used for a different purpose. He objected to any resolution gibbeting his fellow-citizens who were directors of that company behind their backs, and accusing them of neglect, incompetency, and a variety of other faults. He believed the course he suggested was the legal and proper and the best and safest course for the council to adopt.

Mr. DENNEHY seconded the amendment.

Mr. BYRNE and Alderman REDMOND denied that either in the resolution or in any other way did they make such accusations as were alleged, and repudiated any such intention.

Alderman M'SWINEY said, in his opinion, accusations and censures were made against men of integrity, worth, and honour. He did not like such a thing done behind the backs of those accused.

The LORD MAYOR suggested that, after the observations made and assurances given that there was no intention to stigmatize any of the directors—and he might take upon himself to state that there was no such intention—the amendment should not be pressed.

Mr. VEREKER declined to withdraw the amendment, which was accordingly put and lost, only four voting for it.

The original motion was then put, and declared to be carried.

STOURBRIDGE WATER COMPANY.—At the half-yearly meeting of the shareholders, a dividend for the half year, at the rate of 5 per cent., was declared. It was stated that the directors had in contemplation a revision of the water charges, and that if the price of coal and labour continued they proposed to make an application to the Board of Trade, under the recent Act, for power to increase their rates.

IMPURE WATER.—At a recent meeting of the Chemico-Agricultural Society of Ulster, Dr. Hodges reported the results of several analyses of the water of springs. He said that the composition of the water supplied in the districts surrounding Belfast continued to receive attention from him, and in consequence of his representations much improvement had been effected, and the use of some waters which he had found largely contaminated with sewage impurities had been abandoned. This inquiry at the present time was of especial importance. In several cases the outbreak of fever was the first thing which attracted attention to the impurity of the water used. He had formerly reported that the water supplied to the District Lunatic Asylum at Downpatrick had become polluted by sewage matters, derived from sewers which passed near the well. This cause of danger to the inmates of the establishment had now been removed, and lately he had the satisfaction of reporting that the water now supplied was of a very superior quality. A water, Dr. Hodges stated, may be turbid, and deposit a sediment on standing, and be free from sewage impurities. Thus, occasionally the town water was turbid, like all waters from districts abounding in peat, but this impurity did not appear to exercise any effect injurious to health. It should, however, be removed by a more perfect system of filtration than that at present in use. Nitrogenous impurities are, however, very different from those derived from peat and soils rich in vegetable matters, and the presence in a water of a large amount of ammonia or of albumenoid ammonia is always to be regarded as significant of danger. It is true that the large extent of land drained by streams must, in many cases, convey to the rivers from which the water supply is frequently derived, refuse matters containing nitrogenous matter in various forms, even when no sewage matter is present. But this pollution may become a cause of disease, and when wells or streams are situated in the midst of a dense population, the nitrogenous matters carried into them are especially dangerous, and their amount is usually regarded as a measure of the quality of the water and its suitability for domestic use. As an illustration of the power which we possess of preventing disease, the valuable report of Surgeon-Major De Renzy, "On the Extinction of Fever in the Millbank Prison by the Disuse of Thames Water," is most instructive, and deserves the careful consideration of the public bodies in this and other towns. It appears that the convicts in the prison previous to 1822 had been subject to an intestinal flux, which the medical officers supposed to be due to over-feeding and insufficient exercise. The dietary was altered; yet three months after an epidemic of dysentery, diarrhœa, and fever, accompanied with scurvy, began, affecting 500 convicts out of the 880 confined. In 1832 the prison suffered severely from cholera, and then some subsequent severe visitations of dysentery, fever, and cholera. The opinions of the leading scientific men of the metropolis were obtained, and means for securing ventilation, &c., were tried, but without effect. In the years from 1845 to 1854 there were 57 deaths from typhoid. The water supply was changed in August, 1854. Up to that date the water used was taken from the Thames, as it flows by the prison, and purified by filtration. The new supply was from an artesian well in Trafalgar Square. It was during the severe epidemic of cholera, and there were cases of cholera in the prison at the time. Six days after the change the disease suddenly ceased, and a marked improvement took place in the health of the prison. From that period up to April, 1872, a period of nearly 19 years, there have been only three deaths from typhoid—viz., one in 1855, one in 1860, and one in 1865. Of these, the last occurred in a convict who was suffering from the disease at the time of his admission. In the first part of 1854, and before the change of water supply, there had been three deaths from fever and two from diarrhœa. In the 19 years since the change of supply there has been only one death from these diseases, and this change occurred while in all other respects the sanitary condition of the prison remained unaltered. As an instance of the extent to which the wells in the country may become defiled by sewage matter, Dr. Hodges gave the following analysis of water from a well at Larchfield, near Hillsborough, which had been examined for a member of the society:—

An imperial gallon contained—	
Total solid matters	35·0 grs.
Consisting of—	
Mineral and saline matters	22·4 „
Organic and volatile matters	12·6 „
Chlorine, equal to 6½ grs. of common salt per gallon.	
One million parts contained—	
Free ammonia	0·02 part.
Albumenoid ammonia	0·30 „

VIENNA UNIVERSAL EXHIBITION, 1873.

The First List of Awards in the British Section just issued contains the following names of Exhibitors:—

GROUP 3.—CHEMICAL INDUSTRY.

Medal.

Berger, Spence, and Co., Bromley-by-Bow.—Phosphate of alumina; tribasic phosphate of ammonia; ammoniate phosphate manure and alum. *Progress.*

GROUP 7.—METAL INDUSTRY.

Medals.

Best and Lloyd, Cambray Works, Handsworth, Birmingham.—Brass gas chandeliers and gas-fittings. *Merit.*

Blews and Son, New Bartholomew Street, Birmingham.—Chandeliers in metal and glass; gas, steam, and water fittings; hydrants, water-closets, and fittings. *Merit.*

Brown and Co., Wednesbury Tube-Works, Wednesbury.—Gas tubes, fittings; steam and water tubes and fittings; hydraulic tubes; Artesian well-boring tubes, &c. *Merit.*

Ratcliff and Tyler, New John Street, Aston Road, Birmingham.—Gas-fittings, gaseliers, &c. *Merit.*

Russell, Jas., and Sons, Crown Tube-Works, Wednesbury.—Wrought-iron tubes; steam boiler tubes; gas tubes and fittings; stocks, taps, and dies for cutting tube screws, &c. *Progress.*

Winfield, R. W., and Co., Cambridge Street, Birmingham.—Gas chandeliers and fittings, &c. *Progress.*

Honourable Mention.

Benham and Sons, Wigmore Street, London.—Ventilating gas-lamps, &c.; lavatory table; water-closet, &c.

Partridge and Co., Lombard Street, Birmingham.—Gas-fittings; chandeliers or gaseliers, and brackets and ceiling roses.

Warner, J., and Sons, 8, Crescent, Cripplegate, London.

GROUP 13.—GENERAL MACHINERY.

Medals.

Brotherhood and Hardingham, Compton Street, London.—Helical pump (Boulton and Imray's patent), with direct-acting "Paragon" 3-cylinder engine, shown in operation; "Paragon" steam-pump in operation, &c. *Progress.*

Glover, G., and Co., Ranelagh Road, Pimlico.—National standard gasometers, similar to those supplied to Her Britannic Majesty's Government and to the Government of the Netherlands; dry gas-meters and gas apparatus. *Progress.*

Gwynne and Co., Essex Street Works, Strand.—Gwynne's patent centrifugal pumping engine; Gwynne and Beale's patent combined gas-exhauster and engine; double-action centrifugal pumps; hydraulic rams; Girard's patent turbine water-wheel; hydraulic engines. *Merit.*

Hayward Tyler and Co., Whitecross Street, London.—Patent "Universal" steam-pump. *Progress.*

Kennedy's Patent Water-Meter Company, Limited, Kilmarnock.—Water-meters. *Merit.*

Patent Gas Company, 25, Fenchurch Street, London.—Apparatus for the manufacture of gas by Eveleigh's patented process. *Merit.*

Tangye Brothers and Holman, 10, Lawrence Pountney Lane, London.—Steam-pumps, engines, &c. *Progress.*

Warner, J., and Sons, 8, Crescent, Cripplegate, London.—Hydraulic machinery; sanitary apparatus; hand, steam, and horse power pumps; wind engines; water-wheels; fire-engines; hydraulic rams; garden-engines, &c.; water barrows; boring tools; water-closets; lavatories; urinals, &c. *Merit.*

Whitley Partners, Hunslet Road, Leeds.—Peet's valve taps for steam, water, and gas pipes, and mains, and valves: Cameron's "Special" steam-pumps; high-pressure taps; tube wrenches, &c. *Merit.*

Honourable Mention.

Dewrance, J., and Co., Great Dover Street, Southwark.—Steam, hydraulic, and vacuum gauges; water-meters; steam and water fittings, &c.

Gwynne, J. and H., Hammersmith Iron-Works, London.—Centrifugal irrigation pumps.

Haynes, T., and Sons, Edgware Road, London.—Pumps, fire-engines, &c.

Wilson, A., and Son, Vauxhall Iron-Works, London.—Steam-pumps.

Diploma of Honour.

Broughton Copper Company, Manchester.—Copper and brass tubes for steam, gas, water, &c.

GROUP 18.—CIVIL ENGINEERING—PUBLIC WORKS AND ARCHITECTURE.

Medals.

Blakeborough, J., Brighouse, Yorkshire.—Water-works appliances, &c. *Merit.*

Brown Westhead, T. C., Moore, and Co., Hanley, Staffordshire.—Sanitary earthenware for domestic and other purposes. *Merit* (also Medal of Merit in Class 9).

Doulton, H., and Co., Lambeth Pottery, London.—Stone ware (known as Lambeth Pottery), for sanitary purposes, drain-pipes, traps, syphons, sewage-pipes with sluice valves; sinks, closet basins, urinals, &c. *Merit.*

Jennings, G., and Co., Lambeth.—Sanitary apparatus. *Progress.*

Warner, J., and Sons, 8, Crescent, Cripplegate, London. *Merit.*

Honourable Mention.

Gabrielle, A., 4, Westminster Chambers, London.—Hydrants and service hose for water-closets, air-cock and air-valve, self-acting, made by Simpson and Co., Pimlico; ball-cocks, equilibrium, made by Lambert and Son, Lambeth; screw and street cocks, made by Simpson and Co.; bib and stop screw-down cocks and loose valve-cocks, made by Guest and Chrimes, Rotherham; ferrules, straight and elbow, and union joints, made by Rock Brothers and Taylor, Birmingham; hydrants, made by Simpson and Co., and Jno. Barnes, Norwich; meters, low pressure, made by W. Parkinson and Co., Cottage Lane, London; Siemens's high-pressure meter, made by Guest and Chrimes; lead pipes and pipe-guards, urinals, made by G. Jennings and Co.; water pillar, with high pressure meter, &c., made by Guest and Chrimes; water-closets complete, made by the City of Norwich Water-Works Company and Guest and Chrimes.

Skelton, T. A., Essex Street, Strand, London.—Catoptric lamp for street lighting.

GROUP 21.—NATIONAL DOMESTIC INDUSTRY.

Medal.

Silicated Carbon Filter Company, Battersea.—Filters. *Merit.*

LEWES GAS COMPANY.—The annual meeting was held on the 11th ult. The directors reported that "the balance of £2295 1s. 2d., as shown by the statement on the other side, is the profit for the year, and, with the balance of the dividend account of last year—£37 11s. 10d.—amounts to £2332 13s. Of this sum the directors certify that £1527 6s. may be divided among the shareholders, being a dividend at the rate of 9 per cent. per annum (3 per cent. having been already paid on account thereof), that £250 be added to the reserve-fund, and that £555 7s. be retained on the dividend account. The increased profits during the past year result principally from the company's favourable contract for coal (which terminated in March last), the increased value of coke, and the manufacture of sulphate of ammonia, which forms a new feature in the production and profits of the company." The report was adopted, and the dividend recommended therein was declared.

FRICTION OF WATER IN PIPES.

In a perfectly straight and smooth pipe, the quantity of water that will be discharged in a given time depends only upon the head. The velocity of the water will be that acquired by falling through the given head, and the quantity discharged will be the velocity multiplied by the cross section of the pipe. Algebraically, these results will be expressed as follows:—

$$v^2 = \sqrt{2gh}, \text{ and } Q = v \times S,$$

where v is the velocity in feet per second, h the head in feet, Q the number of cubic feet discharged per. second, g the velocity acquired by a body in falling one second, and S the cross section of the pipe in feet.

In practice, it is found that the actual velocity with the smoothest pipes made is much less than the theoretical, part of the head being taken up in overcoming the resistance of friction. In the case of curved pipes, there is another loss of head, and consequently of velocity, at each bend. Numerous experiments have been made to determine the amount of this frictional resistance, and formulas have been constructed from the results. These formulas should always be checked by actual experiment, when great accuracy is required, as the results are greatly altered by seemingly unimportant details. Our object, in this article, is to give the best and simplest formulas for general use. Very good tables, showing the amount of water discharged under different heads from pipes of various diameters and lengths, will be found in Trautwine's "Engineer's Pocket Book."

For smooth iron pipes, Prony's formula is as follows:—

$$h = 0{\cdot}00040085 \times L \div d\,[(v + 0{\cdot}15412)^2 - 0{\cdot}02375)],$$

which may be thus translated: To find the necessary head of water to produce a given velocity of discharge, add 0·15412 to the velocity, square the sum, subtract 0·02375, and multiply the difference by 0·00040085 times the length of the pipe divided by the diameter, noting that all dimensions are to be taken in feet.

In 1858 some very interesting experiments were made by the Brooklyn Water Commissioners to determine the friction in pipes, the pipes experimented upon being very much corroded by long use; and from the data so obtained, Prony's formula was modified to meet this case. The formula constructed from their experiment is: $h = 0{\cdot}00046749 \times L \div d\,(v + 0{\cdot}397)^2$, or: To find the head corresponding to any required velocity, add 0·397 to this velocity (expressed in feet per second), and multiply the sum by 0·00046749 times the length of the pipes divided by the diameter, in feet. For ordinary use, a much simpler formula, by Mr. Lane, will answer:

$$h = 0{\cdot}000625 \times L \div d \times v^2,$$

or: The required head equals the square of the velocity multiplied by 0·000625 times the length, divided by the diameter of the pipe, all measurements being taken in feet.

Knowing the actual head required for any velocity of discharge, we can readily ascertain the head required to overcome friction, and consequently the increased pressure necessary, in pounds per square inch. Thus, the theoretical head (disregarding prejudicial resistances) necessary to produce a given velocity is found by dividing the square of the velocity by 64·4; or, expressed algebraically, the formula is $h = v^2 \div 2g$, and the difference between the actual and theoretical head is the amount required to overcome friction. The pressure per square inch required to overcome this friction is equal to the weight of a column of water of one inch cross section, and with a height equal to the ascertained head.

In order to render the preceding remarks more intelligible, we will assume data and work out an example by each formula. Length of pipe = 100 feet, diameter of pipe = 3 inches. Required velocity = 2 feet per second. By Prony's formula:

$$h = 0{\cdot}00040085 \times (L \div d) \times [(v + 0{\cdot}15412)^2 - 0{\cdot}02375].$$

2. Brooklyn Water Commissioners formula:

$$h = 0{\cdot}00046749 \times (L \div d) \times (v + 0{\cdot}397)^2.$$

3. Lane's formula:

$$h = 0{\cdot}000625 \times (L \div d) \times v^2.$$

A correspondent has asked us what is the difference of friction in a pipe under 15 pounds pressure and under 150. We will use Lane's formula in making the necessary computations for the answer, though the same method would answer with either of the others.

A column of water, to have a pressure of 15 pounds per square inch, must be about 34·6 feet high. We will assume the diameter of the pipe to be 6 inches, and the length to be 500 feet. Then the formula gives: $34{\cdot}6 = 0{\cdot}000625 \times 500 \div 0{\cdot}5 \times v^2$. From which we find that $v = 7{\cdot}44$ feet per second. The theoretical velocity corresponding to a head of 34·6 feet is equal to the square root of 64·4 multiplied by 34·6, or 47·2 feet per second, and the theoretical head necessary to produce a velocity of 7·44 feet per second is the square of 7·44 divided by 64·4, or about 0·86 feet; so that the head necessary to overcome friction is 34·6 — 0·86 = 33·74 feet, and this produces a pressure of about 14·6 pounds per square inch.

In the second case, when the pressure on the pipe is 150 pounds per square inch, the head of water will be about 346 pounds per square inch; and substituting this value in the formula, we have: $346 = 0{\cdot}000625 \times 500 \div 0{\cdot}5 \times v^2$. From which we obtain, $v = 23{\cdot}53$ feet per second. The theoretical head required for this velocity is the square of 23·53 divided by 64·4, or about 8·6 feet; so that the head necessary to overcome friction is 346 — 8·6 = 337·4 feet, which corresponds to a pressure of about 146·2 pounds per square inch. By comparing the velocities under the two given pressures, it will be seen that the velocity is about 3·16 greater in the second than in the first case, while the pressure necessary to overcome friction is 10 times as great in the second case. Now the square of 3·16 is about 10, and we say that friction in pipes increases as the square of the velocity of discharge. We hope we have succeeded in making this matter plain to our readers. We have given them formulas which apply to the flow of water in iron pipes under various conditions, these formulas embodying the results of the most reliable researches on the subject.—*Scientific American.*

ADVANCES IN THE PRICE OF GAS.—At Chippenham the price has been advanced from 5s. to 5s. 10d. The price of gas in Liverpool will be raised 3d. per 1000 feet on and after the 1st of October next; the present price is 3s. 6d. per 1000 feet. The Douglas (Isle of Man) Gaslight Company have issued a notice that they will increase the price of gas to 7s. 6d. per 1000, subject to a discount of 9d. per 1000 if the account is paid within a month. This increase is to take effect on Oct. 1. At Inverurie, N.B., the price has been raised from 9s. 4d. to 10s.; and at Bridge of Weir, N.B., from 7s. 11d. to 9s. 2d. The Gas Committee of the Glasgow Corporation intend to propose to the Town Council that the price of gas in that city shall be advanced from 4s. to 4s. 7d.

SWANSEA.—THE GAS COMPANY AND THE TOWN COUNCIL.—The *Cambrian* says:—"We have no positive information, but we believe we are correct in stating that Mr. Essery, our town-clerk, will present his report upon the whole question of the gas supply and the power of the corporation to manufacture and supply its own gas, at the meeting of the council which takes place on Wednesday next. The report is looked forward to with great interest by the public, more especially by the gas consumers of the town, for it is felt that the question is now ripe for discussion and final settlement. Perhaps greater unanimity prevails upon this question than any other which has occupied the attention of the public for many years past."

LEICESTER WATER-WORKS COMPANY.

The Ordinary Half-Yearly Meeting was held on the 13th ult.—Mr. E. S. Ellis in the chair.

The Secretary (Mr. J. H. Williams) read the following report of the directors:—

Your directors report that during the half year the gross receipts amount to		£9,308	18 2
From which deduct working expenses	£1,484 4 3		
Rates	450 8 7		
Interest	1,134 9 0		
		3,069	1 10
Leaving net profit		£6,239	16 4
Apportioned as required by the company's Act:			
To the shareholders	£5,519 18 2		
To the Local Board of Health	719 18 2		
		6,239	16 4
From the shareholders proportion		£5,519	18 2
Deduct income-tax		97	13 4
		£5,422	4 10
Add balance from last half year and interest		643	13 11
Will leave at the disposal of the directors		£6,065	18 9

From this balance your directors recommend the payment of a dividend at the rate of 5½ per cent. per annum, free from income-tax, carrying forward £565 18s. 9d. to the next half year's account. The sum of £982 18s. 9d., paid out of capital account during the half year, is principally for the extension of mains into new districts. Your directors are able to report a steady increase in the revenue of the company, and that the works are in all respects well maintained.

The Chairman, in moving the adoption of the report, stated that the whole of the capital was now paid up, amounting to £200,000; and the borrowing powers of the company, amounting to £56,536, were also exhausted. The balance at the credit of the capital account on June 30 was £3459. The income of the company had continued steadily to increase, the total amount received this half year being £9308, as against £8710 the last half year. The expenses of this half year compared favourably with those of the last half year, inasmuch as they were £1484, as against £1728 in the half year ending Dec. 31 last. There were some exceptional charges which did not appear this time, which, consequently, made the expenses lighter. Rates and taxes were rather less, and interest on debentures exactly the same. The balance of net revenue was £6239, as against £5298 last half year. As to profit and loss account, they set aside 4½ per cent. on the A shares, and 5 per cent. on the B shares, and then divided the surplus profit with the corporation. The amount they had to receive under that account this time was £719 18s. 2d. In the estimate which he made for the corporation in November last, as to the dividend and surplus profits to be received this half year, he took the dividend at 5½ per cent., which they would probably now declare, and the surplus profits at £400. The surplus profits turned out to be £719, which was £319 better. Then, for the half year ending December last, on March 1 he estimated the dividend at 5 per cent. (they paid 5½), and the surplus profits at £300, and they were £346; so that in fact they would have paid the corporation this year more by £669, in the shape of extra dividend and surplus profits, than the estimate which was put forth on his calculations in October last. He could only say he was very glad it had turned out so satisfactorily. The result of the half year's working was that they were able to recommend a dividend at the rate of 5½ per cent., still carrying over a balance of £565 18s. 9d. It was true they had not quite earned 5½ per cent., as they would have to diminish the balance they had in hand last half year by £65; but it would be recollected that on the last occasion they diminished the balance of the shareholders fund by the sum of £415 to pay 5½ per cent.; and, seeing they were now able to pay 5½ per cent. by diminishing the balance by £65 only, it was very easy to perceive that if the revenue of the company continued to increase, as they had every reason to believe it would, they would very soon be, and, in fact, were now, earning the 5½ per cent. which they were recommended to declare. It would be satisfactory to the shareholders to know that, after the large outlay on capital that they had made, they were able to pay a dividend of 5½ per cent. on the whole capital, besides dividing a very handsome sum in favour of the corporation.

Alderman Hodges seconded the motion.

Mr. Gray asked how it was the amount payable to the corporation had so much increased this half year, when there was no additional amount to be paid to the shareholders.

The Chairman replied that Mr. Gray would recollect he had already explained that last half year they took from the reserve-fund of the shareholders £400 odd, whereas this half year they had taken only £65. The surplus profit with the corporation was divided absolutely every half year, and had to be paid over. It was not so with the shareholders part, which might be placed to their credit, and carried over as a balance. It had been so from time to time, and had been used to equalize the dividend; in fact, they had the dividend of 5½ per cent. last time partly from that fund.

The motion for the adoption of the report was agreed to, and a dividend at the rate of 5½ per cent. per annum was declared payable on the 1st inst.

On the motion of Mr. Gray, seconded by Mr. Johnson, a vote of thanks was given to the chairman, directors, and auditors, for their efficient services.

The Chairman having acknowledged the vote, the proceedings then terminated.

Margate Public Lighting.—The Town Council of Margate, at their meeting on the 26th ult., adopted the recommendation of the Gas Committee to discontinue lighting the town lamps from the 1st of June to the 15th of July inclusive, being three weeks before and three weeks after the longest day. They negatived a recommendation by the same committee to the effect that the town lamps be extinguished every night they are lighted at one o'clock in the morning, but agreed with the committee to propose to the gas company to fix a regulator to each lamp, constructed to burn at the rate of 5 feet an hour, and to pay according to the number of hours burning, at the rate of 6d. per 1000 feet less than the amount charged to the public, and 13s. additional for each lamp per annum for lighting, putting out, and repairing, and that this arrangement be in operation for twelve months from the 31st of August, 1873.

Dorchester Gas Company.—The annual meeting of shareholders was held on Tuesday, Aug. 26, when the following report by the directors was presented and adopted:—"The directors are again able to report satisfactorily on the favourable state and continued success of the company's undertaking. A sum of £279 4s. 6d. has been expended during the past year on the improvement and enlargement of some portion of the works, including condensed liquor-pumps and liquor-tank; and a further sum of £250 has been paid in reduction of the mortgage debt still owing from the company. The directors are confidently in hopes that they will be enabled to further reduce their debt, and to entirely extinguish it at no distant date. In obedience to a resolution of the shareholders, passed at the last annual meeting, the price of gas was raised to 6s. 3d. per 1000 cubic feet at the commencement of the second quarter of the current year, but at the end of that quarter the directors found they were in a position to reduce it to the sum of 5s. 10d. per 1000 cubic feet, at which price it is at present fixed. In consequence of the continued high price of coal, the directors are unable to recommend or hold out any immediate prospects of further reduction. The directors have much pleasure in recommending a dividend of 6 per cent. per annum, free of income-tax, payable on and after the 1st of September."

Faversham Gas Company.—The annual meeting of shareholders took place at the end of last month. The balance-sheet was produced, and a dividend of 10 per cent. was declared on the shares, the 6 per cent. interest on the debentures being payable in February. The directors reported that in consequence of the new contract with the Commissioners of Pavement, by which the company receive an increased price for lighting the public lamps, they had, from the 1st of July, reduced the price of gas to private consumers from 5s. 10d. to 5s. 8d. per 1000, with a further reduction to 5s. for payment within a month.

Ashford Public Lighting.—The monthly meeting of the local board was held on Wednesday, Sept. 3, when the public lighting question was discussed at considerable length. The gas company having raised their charge per lamp from £4 18s. 5d. to £5 12s. 6d. per annum, the Lighting Committee recommended the board to offer £5 5s. per lamp. The gas company declined this offer, but were willing to accept £5 7s. 6d. per lamp. The board now resolved not to go beyond £5 5s. per lamp. It was intimated that the town would probably be left in darkness after the 8th of September.

Boston Public Lighting.—At the monthly meeting of the Boston Local Board, on the 1st inst., the mayor brought up the amended contract between the gas company and the board for lighting the public lamps. He said the directors of the gas company had agreed to the amended clause proposed by Alderman Wright at the last meeting of the board, with two or three verbal alterations, giving it an individual as well as a collective application to the members of the two bodies. Alderman Wright said that as the mover of the clause accepted by the gas company, with a slight alteration pointed out by the mayor, he had very great pleasure in proposing the adoption of the contract as now submitted. He was pleased that the difficulty was at length fairly settled. Mr. Slator, as seconder of Mr. Wright's motion at the last meeting, had much pleasure in seconding the adoption of the contract, thinking the slight verbal alterations introduced by the clerk to the gas company did not amount to much. The proposition was carried unanimously, every non-shareholder in the gas company present voting for it. The mayor having reported that 15 out of the 30 meters required were already fixed, and that the meter system would be fairly in operation in the course of a few weeks, Mr. Slator moved, and Mr. Bedford seconded, that they advertise for tenders for the work of lighting, extinguishing, and management of the lamps. The resolution was carried *nem. con.*

Huddersfield Corporation Gas-Works.—At the quarterly meeting of the Huddersfield Town Council, held on the 20th ult., the minutes of the Gas-Works Committee were read, from which it appeared that at a meeting of the Executive Gas Sub-Committee, held on the 17th of July, it was resolved that the price of gas to public lamps be advanced from 35s. to 39s. per lamp per annum, to commence on the 1st of July inst. It was also resolved that 1000 tons of cannel coal, at 30s. per ton, and 1000 tons of black coal, at 20s. per ton, delivered into the gas-works, be ordered of Abraham Knight. At a meeting of the Executive Gas Sub-Committee, held on the 23rd of July, it was resolved that the price of coke be advanced from 8d. to 9d. per cwt., to commence on the 1st of August next. A letter was read from Mr. Senior, coal merchant, Huddersfield, offering 3000 tons of Parkgate coal at 16s. 6d. per ton, delivered into the gas-works during the twelve months ending the 1st of August, 1874; but it was resolved that the offer be not accepted. At a meeting of the Executive Gas Sub-Committee, the manager presented the poor-rate, which showed an increased assessment of £270, amounting in the whole to £3055; and it was resolved that the manager be instructed to write the poor-rate collector that the corporation had sustained a loss during the past half year, and to state that the committee were willing to be assessed at £3000. At a meeting of the General Executive Committee, held on the 12th of August, the town-clerk reported a further correspondence he had had with the Moldgreen Gas Company, whereby in effect that company definitely declined the offer made to them of 20 years purchase on their annual profit return, to be ascertained by arbitration. The half-yearly return of trading or profit and loss account of the gas-works was submitted by the borough accountant, showing that, after providing for the sinking-fund, there was a loss of £750 16s. 6d. upon the past half year; but as there was a profit upon the previous year of £1864 0s. 4d., which had been carried to the credit of the borough-fund, there was still left a profit of £1313 3s. 10d. since the gas-works became the property of the corporation. It was resolved that the sum of £550 be debited to the borough-fund account. The minutes were adopted, and confirmed by the council.

Stealing Gas at Wakefield.—On Friday last, at the West Riding Police Court, Wakefield, before Mr. J. B. Charlesworth and Dr. Holdsworth, Mr. John Baron, cheese, bacon, and butter factor, &c., Cross Square, was charged with defrauding the Wakefield Gaslight Company, by having laid a pipe from the gas-main to a new villa residence, occupied and belonging to him, and situate near the West Riding Asylum. Mr. Burton prosecuted, and Mr. Gill defended. On the 21st of last month Mr. Moys, an inspector of meters, was going his round as usual, and, whilst examining the meter at Mr. Baron's residence, he discovered that a pipe had been most ingeniously connected with the main, and that the gas being consumed did not pass through the meter. On the following day the inspector, accompanied by Mr. Kemplay, the manager, visited the defendant's shop in Cross Square, and they found that a similar system of fraud was going on there. The defendant at once confessed, threw his arms round the neck of the manager, and begged for mercy. The above facts were not denied, and on behalf of the defendant Mr. Gill tendered to the court his deepest and most sincere apology for what had occurred, and said it had been done without thought. The bench, who said it was a very bad case, ordered the defendant to pay £9 and the costs, altogether £12 4s.

Birmingham Water Supply.—Dr. Hill, the medical officer of health for Birmingham, reports that the water supplied to that town during the month of July was turbid; that it exhibited a diminution of organic nitrogen, but a remarkable increase of ammonia, indicating the recent and sudden access of some impurity to the rivers from which a part of the supply is drawn. The water supplied to Glasgow from Loch Katrine is reported by Professor Bischof to be quite free from any evidence of previous sewage or animal contamination, and to be yellowish and perfectly clear when seen through a stratum one mètre thick.

Warwick Water Supply.—The borough surveyor, Mr. Pritchard, having prepared plans and a report, as engineer to the corporation, for the Haseley Brook scheme, Messrs. Cawley and Newton were appointed by the council to report on the scheme, and have now done so favourably, with some minor modifications. The two reservoirs and other works connected with Mr. Pritchard's scheme they state can be carried out at an estimated cost of £15,000, including land but not water privileges. Mr. Newton, who was present, complimented Mr. Pritchard on the excellence of his scheme. The supply will equal 300,000 gallons a day, or 25 gallons per head for a population of 12,000.

The Velocity of Light.—M. Fizeau has lately published in *Les Mondes* the results of a series of very elaborate experiments, made with a view to the most accurate determination of the velocity of light. The source of the ray was a jet of oxyhydric gas, and the distance between the two stations, as found by careful triangulation, was 33,827·1 feet, with a probable error of 0,001. Six hundred and fifty satisfactory observations were made, the mean of which, multiplied by the index of refraction 1·000 3, gave 185,386 miles per second as the velocity of light to an approximation of 0·003. This result agrees with that previously determined by Foucault, and also confirms the value of the sun's parallax (8″ 86) obtained by La Verrier.

LOUTH WATER COMPANY.—The ordinary meeting was held on the 29th ult. —the Rev. Dr. Parkinson in the chair. The report of the directors stated that 800 shares had been taken, that the total cost of the works was £15,000, and that after receiving from the shareholders £8000, a further sum of £7000 was required to meet the expenses already incurred. The directors, anxious to retain the management locally, agreed to increase their shares by £2000, and several shareholders took from five to ten additional shares each. After some discussion, it was resolved to recommend the directors to pay half the cost of laying down service-pipes as far as 50 feet from the company's mains. The speculation was considered to be a very promising one, and 140 services had already been laid on, which the directors hoped would be doubled in a few months.

STAFFORDSHIRE POTTERIES.—SERIOUS INTERRUPTION IN THE WATER SUPPLY.—The inhabitants of a large portion of the Potteries district, including Hanley, Burslem, Tunstall, Kidsgrove, Wolstanton, Bucknall, Norton, and Smallthorn, have just been forcibly but very unpleasantly reminded of the primitive methods by which they formerly obtained their supply of water. A succession of accidents having happened to the principal main of the water-works company, the flow of water from Wall Grange was cut off for several days, to the very serious inconvenience and loss of the public, water having been sold in some parts of the district at 1d. per bucketful. It appears that some ten years ago the water-works company, with a view to increase the supply to the Birches Head reservoir, laid down an iron pipe two feet in diameter, from the Ladderedge reservoir to Endon, and from Endon to Birches Head put in the 15-inch pipe for which the 2-foot main had been substituted, thus giving two 15-inch mains from Endon to Birches Head. The elevation of the Ladderedge reservoir being great, the pressure upon the main in the valley is enormous, and that pressure, after having been sustained for ten years, caused, at six o'clock on the morning of the 28th ult., a displacement of one of the pipes at Hazlehurst, close to the Leek branch canal. The damage was promptly repaired, and the supply of water resumed; but at five o'clock on the morning of the 29th ult. a still more serious accident happened. Two of these immensely heavy pipes, one six feet long and curved, and the other nine feet long and straight, were blown clean out of the ground and across the canal, Martin, the company's foreman, being very much hurt about his face and eyes by the explosion. The shorter of the two pipes being broken, Mr. Harrison, the engineer, at once set off for Manchester, while his colleague, Mr. Taylor, hastened to Dudley for a new one. Mr. Taylor ascertained that one had recently been despatched to a distance by Messrs. Cochrane and Co., and he followed it as far as Wolverhampton, took possession of it, and sent it on to Hazlehurst with all possible expedition. Before its arrival, however, the damage had to all appearance been made good, Mr. Harrison having strengthened the bend pipe by laying down two baulks of timber 15 inches square, and securing them by chains. At two o'clock on Sunday afternoon the engines at Wall Grange were again set to work, and water flowed into the Potteries on Monday morning. Before long, however, the water forced out the lead in one of the sockets, and again the supply was suspended. This was set right, and on Tuesday water was again to be obtained. The catalogue of disasters is still, however, incomplete, for at six o'clock on Wednesday morning one of the pipes gave way again, and in the afternoon Mr. Harrison laid a 15-inch baulk across the Leek branch canal, at a right angle to the main, and by means of a powerful screw-jack forced the pipe into its proper position, and held it there. The engine was started again at five o'clock on Wednesday afternoon, and we have not heard that anything has since occurred to interfere with the regular flow of water. The traffic on the canal is stopped for the present.—*Staffordshire Advertiser.*

SOUTHBY'S ECONOMIC GAS RANGES AND ROASTERS.—In our notice of the Gas Cooking Apparatus at the International Exhibition, in the JOURNAL of July 29, no mention was made of these inventions, the omission arising from the fact that they are not placed with other apparatus of the same class, but are to be seen in operation at the entrance of the School of Cookery. The special feature of the inventions, and in which they differ from other apparatus for gas cooking, is the arrangement by which the gas is burnt in a chamber or chimney, the lower end of which is left entirely open, while its upper end delivers a highly heated current of air into the oven or range containing the articles to be cooked. The advantages which the inventor claims for this arrangement are the following:—1. The gas being burnt in a strong current of fresh air, the combustion is perfect. 2. The heated air escaping only at the bottom of the vessel instead of, as in other apparatus, at the top, it is that portion which has given out its heat to the articles in process of cooking that escapes instead of the hottest and unused portion, thus producing a much greater economy of gas. 3. The meat always being cooler than the air by which it is cooked, it is surrounded by a descending current, which, the exit being at the bottom, escapes freely; whereas if the exit was at the top it could only eddy round and round. This causes the great bulk of the air admitted into the apparatus to pass immediately over the surface of the meat, carrying away with it all the vapours given off as fast as they are produced, thus ensuring the same perfect ventilation as before an open fire, and preventing any possibility of the disagreeable flavour of oven-cooked meat. An incidental advantage of the even temperature secured by having only a bottom exit for the air, is that all the space in the apparatus is available for cooking, which makes it an unrivalled oven for baking pastry. As the burner which is employed consists of the common fishtail jets, it cannot be lighted in the wrong place, as the atmospheric burners are liable to be, even in the most experienced hands, thereby causing imperfect combustion and offensive smells, and its isolated position in a chimney prevents the gravy falling upon it and both choking the burners and producing the smell of burnt fat. By the same means so large a volume of pure hot air is forced through all parts of the apparatus that a larger amount passes over the meat than even before an open fire.

MARYPORT TOWN AND HARBOUR GAS COMPANY.—The annual meeting of this company was held in the Athenæum, Maryport, on Saturday, Aug. 30 —Mr. Hobson, chairman of the company, presiding. The report stated that the gross receipts and expenditure for the last twelve months amount respectively to £2248 9s. 3d. and £1372 5s. The increase in the receipts for the past year over the preceding year amount to £469 11s. 8d., earned at an additional expenditure of £332 9s. 1d. The balance to the credit of net revenue, after payment of the interest on the company's loan capital and bank interest and commission, was £795 2s. 7d. Out of this sum the directors proposed to appropriate £499 4s. in the payment of a dividend at the rate of 5 per cent. per annum, and to carry the balance of £295 18s. 7d. to the credit of the current year. The capital account showed an expenditure during the year of £476 17s. 4d. The new works completed were a retort-bench and eight retorts; a station-meter had also been purchased, and other additions and improvements were in progress. When these latter are finished the company's works will be in a perfect state, and capable of meeting the growing wants and requirements of the town and district for many years to come. The company's coal contract (which for the past two years has been at the rate of 10s. 3d. per ton) expired on June 30 last. A new contract has since been entered into for a further period, but at a considerably advanced price—namely 21s. per ton. At the close of the last session of Parliament an Act was passed for the relief of gas companies whose limited maximum rates will not enable them, after meeting their largely increased expenditure caused by the late excessive rise in the price of coals and labour, to pay a dividend of 5 per cent. The Board of Trade are empowered, on proper application being made to them, and sufficient grounds shown, to sanction an addition to the rates of companies who otherwise will be unable to pay a 5 per cent. dividend. The directors proposed, with the approval of the shareholders, to be expressed at that meeting, to take immediate steps to procure from the Board of Trade a Provisional Order for such an extension of the company's maximum rates as the circumstances of the company may require. The company's position being now financially sound, and its receipts yearly increasing, the directors thought the time had arrived when a further issue of the unallotted shares to the extent of £1400 should be made, to relieve the company from its indebtedness on capital account, and to complete the new and additional works which are now in progress. They therefore strongly urge upon the shareholders the desirableness, as well as the necessity, of their at once applying for an allotment of these shares. The shares are of the nominal value of £10 each, and it is proposed to issue 140. The directors themselves are prepared to co-operate with their fellow-shareholders, and to subscribe for a fair proportion of the proposed allotment. To provide, however, against the contingency of the new shares not being subscribed for, the sanction of the shareholders was asked to an application being made to the Board of Trade for a Provisional Order empowering the company to issue preference shares in lieu of ordinary shares, to bear a fixed dividend at the rate of 5 per cent. per annum. The directors, however, trusted that the shareholders, by responding to their recommendation, and taking up the shares, would render an application for a Provisional Order unnecessary. The report was adopted, and a dividend declared of 5 per cent. on the stock and share capital, free of income-tax. In accordance with the Act of Parliament passed for the relief of gas companies whose limited maximum rates would not enable them, after meeting their largely increased expenditure caused by the late excessive rise in the price of coals and labour, to pay a dividend of 5 per cent., the directors were empowered to apply to the Board of Trade for a Provisional Order to increase the company's maximum charges. The retiring directors and auditor were re-elected, and the annual remuneration fixed at 25 guineas for directors and five guineas for the auditor. The meeting terminated with a vote of thanks to the chairman.

Register of New Patents.

3456.—HOLCROFT, J. T., Bethnal Green Road, "*Improvements in apparatus for preventing waste of water, applicable to water-closets and other like purposes.*" Provisional protection only obtained. Dated Nov. 9, 1872.

This invention consists of a service-box, containing just so much water as is required at each discharge, fitted to an ordinary cistern, and is provided with two valves, one of which opens to fill the box, while the other opens to supply the closet, and *vice versâ*, the box valve closing before the closet valve begins to open.

3464.—HILLS, E., Worsash, Southampton, and BIGGS, B., Laurence Pountney Hill, London, "*Improvements in deodorizing and purifying sewage and other excrementitious matters, and in obtaining certain useful products therefrom.*" Patent dated Nov. 20, 1872.

According to one process the matters to be treated are mixed with lime in an air-tight tank. Air is then forced through them so as to precipitate the solid parts. The air is then conveyed to a second tank, carrying with it sulphuretted hydrogen and ammoniacal gases. This second tank contains sulphurous acid, through which the gases are passed, and sulphite of ammonia and sulphur are obtained. Or they may be passed through sulphuric or muriatic acid in the second tank to fix the ammonia; and the sulphuretted hydrogen, and other uncondensed gases are afterwards passed through sulphurous acid, or through hydrated oxide of iron, contained in a third tank, to decompose the sulphurous hydrogen and obtain sulphur. The sewage precipitate in the first tank may be used as a manure. According to another process, the matters to be treated are placed in an air-tight tank, and sulphurous acid forced through them to precipitate the solid parts, and fix the ammonia, and decompose the sulphuretted hydrogen, and obtain sulphur therefrom. The sewage precipitate or sludge thus obtained may either be dried and used as a manure, or it may be burnt, so as to cause it to give off its sulphur in the form of sulphurous acid gas, or be otherwise utilized.

3467.—TULLY, T. D., South Lambeth, Surrey, and ROBINSON, J. T., Haverstock Hill, Middlesex, "*Improvements in making gas and water supply-pipes, equally applicable as a preventive against fire.*" Provisional protection only obtained. Dated Nov. 20, 1872.

This invention is intended to render the escape of gas almost impossible, and by similar means to extinguish any fire. This is effected by combining the gas and water supply-pipes, so that in the event of fire every gas-pipe is converted into a water-pipe, and every valve and cock into high-pressure water-pipes, and directed to the seat of the fire. The fire being extinguished and the gas again required, the water is drained off by means of a cock. An additional arrangement is made in the roof of theatres of several self-acting valves which no gas pressure can open, but which the water pressure would immediately open, and throw upon a fire so many large streams of water that the fire would be extinguished.

3473.—HARRISON, C. W., and HARRISON, A. H., both of High Holborn, "*Improvements in apparatus for charging or impregnating atmospheric air with vapour of hydrocarbon liquids.*" Patent dated Nov. 20, 1872.

This invention which consists in directing under pressure by suitable apparatus fine streams of air on to the surface of hydrocarbon liquid, is not described apart from the drawings.

3489.—BLOGG, C. A., Croydon, Surrey, "*An improved water-waste preventer cistern.*" Provisional protection only obtained. Dated Nov. 21, 1872.

This invention consists of two chambers communicating at bottom by a valve, and called the store and flushing chambers, the former being supplied from the service-main, and serving as a reservoir to fill the latter, from which the water passes to the closet. The service-valve and the valve between the two chambers is so constructed that when the former is opened the latter is closed, so that the supply of water to the closet is limited to the contents of the flushing chamber. When the service-valve is shut, the other valve is opened, and communication between the two chambers re-established, so that the flushing chamber is at once refilled, and the closet may be used several times without waiting for the cistern to be filled from the service-main, which is important where the service is interrupted for a length of time, as at night.

3490.—BROOKES, W., Chancery Lane, London, "*Improvements in joining the ends of pipes or tubes.*" A communication. Patent dated Nov. 21, 1872.

This invention is applicable to joining the ends of either socket or plain-ended pipes or tubes. When joining socket-pipes, the outer surface of the spigot end may be cylindrical or wedge-shaped, tapering towards the body of the pipe, and one or more grooves may be formed round the part to be inserted into the socket of the adjoining pipe. The extremity of the spigot end may be of less diameter than the other part, forming a shoulder to abut against a corresponding shoulder inside the socket, which has also a groove or depression round its inner surface, and a double shoulder for the spigot to rest against. When the pipes are one against the other, the spigot end of one pipe abuts or nearly so against the inner end of the socket of the other pipe, a band of lead (wedge-shape or tapered section answering best) is inserted between the socket of one pipe and the spigot end of the other, so that the smaller edge

of the lead band will penetrate between and fill the space between them on being forced in, and also fill the grooves or depressions in the socket, or socket and spigot, making a tight joint. Or a ring of india-rubber or other elastic material may be used in a groove round and near the spigot end of the pipe, and the lead forced in to between the socket and spigot; or, when this elastic ring is used, the groove or depression in the socket may be dispensed with, and two metal half cylinders or rings (say cast iron) introduced between the socket and spigot, and pressed up against the elastic ring by keys inserted between the half cylinders and lugs cast on the pipes.

When joining plain-ended pipes their ends are made cylindrical or wedge shaped, and with one or more grooves round them if required, and the extreme ends of the pipes may be of less diameter, forming a shoulder. A cylindrical collar of cast or wrought iron with a central rib around it, forming a double shoulder for the pipe ends to rest against, or if a longer collar be required two ribs, each with a double shoulder, may be cast or formed, one near each end of the collar, or to join the ends of two plain cylindrical pipes together, the double shouldered rib or ribs may be dispensed with, and a simple circular projection formed round the inside of the collar for the lead to bear against. A circular groove or depression is formed round the inner surface of each end of the collar, between the rib or projection and the mouth of the collar. The ends of the pipes to be joined are introduced one into each end of the collar, and a belt or band of lead forced between the collar and pipe ends, at each end of the collar, firmly securing the pipes together.

3502.—HOWLAND, T. A., and M'KNIGHT, C. G., both of Providence, Rhode Island, U.S.A., "*Improvements in the manufacture of gas, and in apparatus therefor.*" Patent dated Nov. 22, 1872.

This invention consists, first, in the production of the gas by the admixture of atmospheric air with a hydrocarbon fluid in a gasometer or gasholder, whence the gas is taken directly to the burners; and, secondly, in the peculiar construction of the gasholder and other apparatus. The upper or moveable part of the gasholder is constructed with a separate chamber for containing the hydrocarbon fluid. This chamber communicates by tubes with the body of the gasholder, which is filled with air. The gasholder is also provided with a central rod and tube for guiding the upper part as it rises and descends. In some cases an apparatus consisting of a vase packed with wool or other porous material, which holds the hydrocarbon fluid, is used. The vase has a perforated tube covered by a sleeve, through which sleeve and tube the gas is conducted to the burner. Air is admitted to the porous packing through a hole at the top of the vase.

3513.—WRIGHT, W., Sheffield, "*Improvements in apparatus for preventing the waste of water, applicable to water-closets and other purposes.*" Patent dated Nov. 23, 1872.

In this invention a moveable cistern works within an outer cistern, the latter corresponding in capacity with the quantity of water to be discharged or measured at each action of the apparatus. Each cistern has a valve at bottom, which is opened and closed as required by the action of the moveable cistern, the valves being closed by their own gravity, and opened without any connecting rod, wire, or chain.

3534.—THORNELOE, G., 34, London Wall, "*An improved dip-pipe, forming part of gas apparatus, for use in making gas.*" Patent dated Nov. 25, 1872.

This invention has for its object improvements in dip-pipes, used for sealing, unsealing, or regulating the seal in the hydraulic main. For this purpose a wrought or cast iron dip-pipe is made to work through a stuffing-box or stuffing-boxes, the dip-pipe to be raised or lowered as required by a fixed rod working through a stuffing-box on the top of the H-pipe or hydraulic main, and to be raised or lowered by means of a screw or lever on the rod, the lever being fixed on the bridge-pipe, hydraulic main, ascension-pipe, or otherwise, as most convenient.

3605.—GEDGE, W. E., Wellington Street, Strand, "*An improved apparatus or cock with safety-plug for preventing fraud in the consumption of lighting gas.*" A communication. Provisional protection only obtained. Dated Nov. 30, 1872.

This invention consists in fitting the plug of the main supply-cock with a stop, in such a manner that the plug may be partially withdrawn from its seat for cleaning, but cannot be wholly removed and another substituted without the destruction of some part of it.

3647.—MURDOCH, H. H., Staple Inn, Middlesex, "*Improvements in the joints of pipes or tubes.*" A communication. Patent dated Dec. 3, 1872.

According to this invention the ends of the pipes or tubes to be joined together are formed with two annular ribs or projections separated by a groove. A cylindrical ring or belt of vulcanized india-rubber, the ends of which are turned up so to form a projecting rim on each side, is passed over the ends of the adjoining pipes, and over the india-rubber belt is placed a hinged metal collar formed inside with annular projections to correspond with the projections upon the pipe ends, allowing for the thickness of the india-rubber between the two. The collar is closed round the pipe ends and india-rubber belt by a pin. Suitable lugs formed on the free ends of the collar.

3652.—TEALE, W. E., Mark Lane, Manchester, "*Improvements in guards for gas lights, and in an improved method of lighting gas while under the protection of guards.*" Patent dated Dec. 4, 1872.

This invention relates to the protection of gas lights in cotton mills and similar manufactories, and consists—Firstly, in the application and use of protecting guards arranged so as to prevent any tampering with the gas flame, and to prevent any inflammable matter coming in contact therewith. Secondly, in a new and improved method of lighting the gas without removing the protecting guard. In carrying out the first part of the invention, around the gas burner is permanently fixed a frame made of brass or other suitable metal, the top and bottom of which is closed in with gauze and glass; into the sides of this frame bent glass plates are placed so as to be moveable upwards or downwards in a slide. The second part consists in fixing to the side or other convenient part of the brass frame, by means of a moveable joint, a pencil tube, into which is placed a fuze or match, so constructed that it may slide backwards and forwards through the pencil tube, so that the end of the fuze may be brought into contact with serrated metal or other prepared surface which, by friction, will ignite the fuze or match, and the gas thus be lighted.

3693.—HASELTINE, G., Southampton Buildings, London, "*Improvements in meters for gas or liquids.*" A communication. Patent dated Dec. 6, 1872.

This invention relates more especially to that class of meters known as diaphragm meters, in which a central diaphragm is carried from side to side by the inflow of water alternately upon each side through ports, the movement of the diaphragm through intermediate connexions operating the valves to regulate the supply and discharge. It consists mainly—first, in the employment of a projection of prismatic form attached to the yoke operated by the disc arms in connexion with a corresponding apex upon the carrier frame which operates the valves; second, in the employment of a pendent carrier frame for supporting the valve-rods and valves; third, in the combination of a central diaphragm with enclosing discs, the diaphragm being adapted to vibrate between the discs which are connected at their edges to the diaphragm, and adapted to move as one mechanism when operated by the diaphragm; fourth, in the combination of a cast valve stem having valves of peculiar construction with a divided valve chest; fifth, in certain other combinations covering details of construction.

3728.—SHEDLOCK, J. F., and SHEDLOCK, J. J., Harrow Road, Middlesex, "*Improvements in the lighting of towns and districts, and apparatus connected therewith.*" Patent dated Dec. 9, 1872.

According to this invention atmospheric air is forced into an accumulator, or an ordinary gasholder, by rotary air-pumps driven by steam or other power. Before entering the air-pumps the atmospheric air may be freed from moisture or other impurity by being made to pass through a material having an affinity for such impurities. The accumulators capable of resisting the expansive force of the compressed air contained therein are fitted with pressure gauges, safety-valves, and inlet and outlet pipes; the inlets being provided with non-return valves for the purpose of relieving the air-pumps of any back pressure; and the outlet-pipes are fitted with valves for the purpose of regulating the flow of air to the governors, by which means it is delivered to the mains at a uniform pressure. After passing through the mains and service-pipes the air passes through a reservoir, the lower part of which, forming a vaporizing chamber, is so constructed as to expose a large surface to the action of the air. The vaporizing chamber is filled with an absorbent material, and supplied with a hydrocarbon liquid from the reservoir, the supply being regulated by the level of the liquid in the vaporizing chamber, and the pressure of the air passing through it. The inlet and outlet pipes of the reservoir and vaporizing chamber are fitted with cocks or valves so arranged that they are opened and closed simultaneously. The hydrocarbon liquid is supplied to the reservoir through a cock or valve having a connexion attached thereto common to all reservoirs. The street-lamps may be supplied with the illuminant from a reservoir contained in the base of, or in a box let into the ground near to, the lamp-post. Public and private buildings may be lighted by a supply of the atmospheric air saturated with hydrocarbon vapour, the reservoir being placed in any convenient spot, whether inside or outside the building.

3744.—KEY, W., Gas-Works, Dumbarton, "*Improvements in gas-retort settings.*" Patent dated Dec. 10, 1872.

This invention has reference to an improved arrangement of setting gas-retorts in the ovens in which they are enclosed, and consists in erecting on each side of the furnace a number of transverse or diagonal pillars whereon the lower retorts are placed. Upon these lower retorts blocks are fitted at intervals to support the upper retort. The space on each side of the upper retort, and between it and the lower retorts, is filled in, and in the same way the spaces between the lower retorts, and the sides of the oven are closed by flue covers, except at certain places where passages, provided with dampers for the purpose of regulating the heat, are left in the flues. By this arrangement and by the closing of the dampers the oven may be completely divided into two longitudinal sections, the lower being shut off from the upper half. The heat from the furnaces after traversing the flues will pass up the damper passages to the top of the oven, and thence may be taken off either at the front through an opening in the roof of the oven connected to the main flue, or through other passages to front, which communicates with spark holes leading to a space or flue constructed for the purpose, and situated beneath the lower retorts at or about the level of the floor. Thence the heat will travel up one or more spark holes at the back or in the division wall, where through or double retorts are employed, to the main flue and shaft or chimney. By placing guards so as to defend the retorts from the action of the fire, this form of setting may be advantageously employed where iron retorts are used, more especially as by this method of construction the retorts are not exposed to cross currents of heat.

3795.—EDWARDS, W., Hungerford Road, Holloway, "*Improvements in rotary pumps.*" Patent dated Dec. 14, 1872.

This invention relates to the construction and arrangement of the pipes and other parts of rotary pumps acting by the movement of two cog-wheels within a case. The openings of the supply and discharge pipes into the case are made long and wide with a middle fin which forms a lap for the revolving cogs; the shaft bearings are elongated by being made in bosses projecting inwards; the gearing is cased in and the suction-pipe is made to dip down into a well so as to seal its mouth with liquid, thereby dispensing with a foot-valve.

3808.—BAILEY, W. H., and GRINDROD, J., both of Albion Works, Salford, "*Improvements in apparatus for raising, forcing, and measuring liquids.*" Provisional protection only obtained. Dated Dec. 16, 1872.

The features of novelty in this invention consist in constructing an automatic apparatus, which is useful as a boiler feeder, and for raising and forcing liquids generally by the alternate action of steam pressure and vacuum controlled by a compound valve and float, or its equivalent, the apparatus being also capable of measuring the quantity of liquid passing through it by the application of counting mechanism to an oscillating lever jointed to the spindle of the compound valve.

3822.—KINSEY, J., Leith, "*Improvements in liquid meters.*" Patent dated Dec. 17, 1872.

This apparatus comprises a discharge passage and a chamber containing measuring apparatus. There is a small inlet through which a certain small proportion of the water discharged enters the top of the chamber, dropping thence into a dish or pan, which is set on an horizontal axis and is divided by a middle partition. When the water fills either of the compartments up to a certain level it causes the dish to overbalance and empty, and this action turns up the other compartment into the position for being filled. The movement of the tilting dish is communicated to counting mechanism, and the water falling from the dish passes out through a small aperture in the bottom of the chamber.

3824.—PRINCE, A., Trafalgar Square, Charing Cross, "*Improvements in hydro-oxygen gas-burners.*" A communication. Patent dated Oct. 17, 1872.

The novelty of this invention consists in providing two separate thoroughfares in the burner, one for the coal or hydro-gas and the other for oxygen or the gas of combustion, the latter being regulated by a moveable cap, so as to impinge as desired upon the coal gas as it escapes from the burner.

3829.—LACKERSTEEN, J. F., Lombard Court, London, "*Improvements in the manufacture of hydrogen gas.*" Patent dated Dec. 17, 1872.

This is an invention of a method of manufacturing hydrogen gas by passing steam, superheated or otherwise, through or over heated manganese, or any suitable compound thereof, by which means the steam is decomposed, the oxygen being absorbed by the manganese and the hydrogen set free, to be conveyed away by suitable means, and used for whatever purpose it may be required.

3852.—HENDERSON, A. C., Charing Cross, "*Improvements in apparatus for filtering and defecating water by radiation.*" A communication. Patent dated Dec. 19, 1872.

This apparatus consists of two filters communicating one with the other by means of a pipe and central three-way tap connected with a main or supply pipe; these filters are each provided with double filtering cylinders in the interior, the outer cylinders are furnished with charcoal, and the inner ones with sponge or other substance. The water entering the filters passes through the perforated filtering cylinders, and converges towards central pipes pierced with holes, which deliver it in a filtered state to a conduit. The invention also relates to the application of the filters for purifying water containing calcareous salts, so as to render it fit for industrial purposes by preventing incrustation of boilers. Before passing the water through the filters, water rich in bicarbonate of lime, a little lime water is added, which immediately troubles the water by the formation of insoluble carbonate of lime, and passing it through the apparatus the carbonate is retained, and the water purified and clarified.

3833.—THORP, T., Manchester, "*An improved equilibrium tap and self-closing bush-valve, and the application of the bush-valve to taps in general.*" Provisional protection only obtained. Dated Dec. 18, 1872.

At the top of the barrel of the tap there is a screwed cover and packing, through which is passed a spindle, having at the top a knob or button, and at the bottom a shoulder with packing supporting a metal washer, and a disc-valve of leather or other yielding material, the washer and valve being held together in the middle by a screw encircling the spindle, but having sufficient space between them to allow the passage of water or other fluid. The outer circumference of the valve is held to the body of the tap by a cup and screwed ring, and in the valve at any desired position there is a hole leading from the supply to the cup below the valve, the hole in the leather being surrounded with metal.

3863.—SIMON, L., and SIMON, R., Nottingham, "*A new or improved method of applying petroleum products to illuminating purposes, and apparatus belonging thereto.*" A communication. Patent dated Dec. 20, 1872.

In carrying out this invention, one of the products of the distillation of petroleum, such as naphtha, gazoline, or any other suitable hydrocarbon, is employed, and by means of a suitable apparatus a current of atmospheric air is caused to pass over it or through it in such a manner that the air becomes strongly charged with the vapour of the hydrocarbons. This air is then conducted, mixed with the vapour of the hydrocarbon, into a suitable receptacle, whence it is conducted through ordinary pipes to the ordinary burners, or to the burners made on purpose. The burners are divided by screws in order to obtain a stronger current of air, by which the flame becomes better adapted for heating or smelting purposes. Independently of these specially constructed burners, all burners generally used can be used in connexion with the apparatus, both kinds of burners giving a cheaper and superior light than that obtained by the use of coal gas. The apparatus consists of a box made of tin or other suitable material divided into various compartments, one of which is the reservoir for hydrocarbon, which compartment is again divided into smaller compartments to facilitate the evaporation, by means of sponges or other materials, and also shows the quantity contained in it; and is also provided with locks or taps for regulating the same in it. Another compartment forms a reservoir for water, which exercises a pressure upon the atmospheric air; another compartment contains some fans or other suitable machinery worked by weights to create the current of air to be mixed with the hydrocarbon.

3866.—KENNELLY, T., Birmingham, "*Improvements in blow-pipes used in soldering and brazing metals and for other purposes.*" Patent dated Dec. 20, 1872.

This invention refers to blow-pipes in which a mixture of air and gas under pressure is burned at the nose or jet of the blow-pipe. A spring valve is introduced into the pipe conveying the gas, which when in its normal position shuts off the gas. A lever connected with the valve is so arranged that when the blow-pipe is grasped for use the lever opens the valve and permits the passage of the gas. On putting aside the blow-pipe after use, the valve closes and cuts off the supply of gas. By means of a very small pipe, independent of the principal gas-pipe, a small flame or igniter is always maintained at the nose or jet, which immediately ignites the principal current of gas when the workman grasps the blow-pipe for use. When the gas is shut off the current of air issuing from the central orifice of the blow-pipe serves to cool the work. The minute flame or igniter being produced by gas unmixed with air is very luminous, and enables the workman to examine his work by its light.

3880.—SYMINGTON, R. S., Glasgow, "*Improvements in applying gas for heating purposes, and in apparatus connected therewith.*" Provisional protection only obtained. Dated Dec. 21, 1872.

According to this invention pieces of pumice-stone are arranged in the grate in imitation of ordinary lumps of coal, and the gas is admitted by one or more pipes, perforated with a number of small holes, into a space formed within or between the pumice-stone pieces. Air is admitted through perforated plates at the back and bottom of the grate or at the bottom only, to mix with the gas. Asbestos in a loose fibrous state is filled in between the pieces of pumice-stone, and the mixed air and gas permeating through this asbestos burns amongst it or on its surface, raising it and the adjacent pumice-stone to an incandescent and glowing state.

3897.—MANN, W., Gas-Works, Dorset Street, London, "*Improvements in machinery and apparatus for charging and discharging gas-retorts.*" Provisional protection only obtained. Dated Dec. 24, 1872.

This invention has for its object the reduction of manual labour, by the substitution of machinery worked by steam or other suitable power, the different parts of the apparatus being operated upon through the intervention of pressure or a vacuum. The machine is made so that it can travel to and fro in front of the retorts, and certain parts of it are so arranged that the scoop or rake may be raised or lowered to suit the position of the retorts. The apparatus is preferred to be made in two separate and distinct machines, one for charging and the other for drawing.

The apparatus for charging the scoop with coal consists of an elevator and accessories. A receptacle for coals is attached to the bottom of the machine, and in it is placed a drum, a corresponding drum being erected overhead. Around these drums two endless pitch chains, with buckets, work, carrying the coal from the receptacle to the top of the elevator, when they are suddenly tilted, and the coals contained in them are thrown into a hopper. The novelty in this part of the apparatus is the use of an upright elevator, and the manner in which the buckets are hung and tilted. The hopper supplies coal to a horizontal case, into which it is drawn by a screw. When the case is filled, its bottom is opened and the coal falls down a shoot into the scoop. In case the coal-supplying screw runs too fast, means are provided for returning the surplus coal to the receptacle, or by a sliding action of the end of the case operating upon levers, the screw is stopped. Means are also provided for stopping the elevator should the hopper become surcharged.

The scoop consists of two parts divided along its bottom, and is made to enter the retort by means of chains actuated by the engine power through the intervention of gearing, or by the application of a vacuum, for the production of which special apparatus is provided. When the scoop has attained a suitable distance in the retort it is thrown open, and the coal is distributed in a crescent or semi-circular shaped layer in the retort. The scoop is then withdrawn, and is ready to receive another charge of coal.

The discharging apparatus consists of a rake-bit, or head, which is attached to either a solid or hollow bar, having an axial motion, and is also furnished with subordinate bits, to enable the rake to bite into the coke and do its work more effectively. When the rake bar is passed into the retort and has obtained full hold of the coke, it may be withdrawn by impulsions, or by one steady pull, or a combination of both. An implement something like a scoop, semi-rotative cutter, or bar shovel is also provided to assist the rake in removing the charge when found necessary.

3905.—RADFORD, J., Bradford, "*Improvements in steam, gas, water, or fluid taps.*" Patent dated Dec. 24, 1872.

This invention relates to the employment of fixed plugs or stoppers, and moveable barrels, which are made conical and hollow, having a divisional piece cast near the centre; steam, gas, water, or fluid passing through the plug or stopper comes in contact with the divisional piece, passes through an opening near the divisional piece, then through a passage made in the barrel, and onwards through another opening in the plug or stopper, in a line and on the other side of the divisional piece. The barrel is moveable, and is turned on or off by means of a handle fitted in the metal forming the hollow passage.

3951.—MACKINNON, H., Toronto, Canada, "*Improvements in lamps to be used for cooking, heating, and lighting purposes.*" Provisional protection only obtained. Dated Dec. 30, 1872.

This is an apparatus for supplying oxygen direct to the flame of a lamp sufficient in quantity to cause the complete combustion of all the obnoxious gases usually thrown off therefrom. Also of a stand and cover or chimney for the flame, by which the cooking utensils can be held over the flame, whilst at the same time full benefit from the lamp as an illuminator is secured.

APPLICATIONS FOR LETTERS PATENT.

2781.—WARREN, W., Cheltenham, "Improvements in and applicable to pumps." Aug. 22, 1873.

2782.—BRACHIONY, L. M., and DESCHAMPS, J. E., jun., Rouen, France, "An improved machinery for obtaining motive power by means of water and air or other fluid." Aug. 22, 1873.

2784.—WILSON, A. F., Buckingham Street, Adelphi, "Improvements in apparatus for lighting and extinguishing public and other gas-lamps or lights." Aug. 22, 1873.

2791.—GOODALL, R., Armley, Leeds, "Improved means or method of treating and clarifying impure or waste water." Aug. 23, 1873.

2812.—LAKE, W. R., Southampton Buildings, London, "An improved machine for forming the internal screw-threads of gas-fittings." A communication. Aug. 26, 1873.

2834.—MAITLAND, W. H., St. Swithin's Lane, London, "Improvements in the manufacture of gas, and in apparatus employed therein." A communication. Aug. 28, 1873.

2840.—JOHNSON, J. H., Lincoln's Inn Fields, "Improvements in apparatus for generating hydrogen or carburetted hydrogen gas, and in the means for evaporating the dilute acid employed in generating the gas." A communication. Aug. 28, 1873.

2842.—WALSH, W. J., Birmingham, "Improvements in gas-chandeliers or gaseliers, and in gas and other lamps." Aug. 28, 1873.

2856.—TYSOE, C., Salford, "Improvements in means for supplying tar, oil, creosote, spirit, or other ignitable fluid or fatty matters to furnaces, and for promoting the combustion of such matters." Aug. 30, 1873.

2889.—GREEN, H., Preston, gas engineer, and BARROW, J., West Gorton, near Manchester, manufacturing chemist, "Improvements in effecting the ignition of gas, and apparatus and means for opening the supply of gas to burners, for igniting the gas, and for extinguishing gas-lights." Sept. 2, 1873.

2901.—YARROW, E. H., Camberwell Park, Surrey, "Improvements in the manufacture of gas for lighting and heating purposes, and in furnaces and apparatus for the same." A communication. Sept. 3, 1873.

GRANTS OF PROVISIONAL PROTECTION.

2419.—SALMON, P., 5, Mabledon Place, Burton Crescent, London, W.C., "Improvements in steam-boilers and gas apparatuses, and in gas engines and boilers, and in apparatuses connected therewith, to warm, ventilate, light, signal, and break in cr on railway carriages and other vehicles." July 14, 1873.

2713.—ROBINSON, A. H., Dublin, "Improvements in water-meters." Aug. 15, 1873.

2729.—FREESTONE, J. W., Dalston, Middlesex, and HUMPHRIS, J., Little Ilford, ESSEX, "An improved process and apparatus for treating spent oxide of iron to extract sulphur and ammoniacal salts therefrom, and for purifying these products." Aug. 18, 1873.

2734.—FORSTER, J. R., 6, Market Street, Newcastle-upon-Tyne, "An improved elastic spigot and socket pipe-joint for gas, water, steam, and liquids." Aug. 18, 1873.

2755.—CARTER, C., Liverpool, brassfounder, "Improvements in apparatus for drawing and preventing waste of water from pipes, mains, cisterns, or other sources for domestic or other purposes; also for water-closets." Aug. 20, 1873.

2759.—CLARK, A. M., Chancery Lane, London, patent agent, "Improved apparatus for regulating or controlling the supply of gas or water in buildings." A communication. Aug. 20, 1873.

2779.—LAKE, W. R., Southampton Buildings, London, "Improvements in apparatus for the production of light from benzine, naphtha, and other like substances." A communication. Aug. 21, 1873.

2781.—WARREN, W., Cheltenham, "Improvements in and applicable to pumps." Aug. 22, 1873.

2782.—BRACHIONY, L. M., and DESCHAMPS, J. E., jun., Rouen, France, "Improved machinery for obtaining motive power by means of water and air or other fluid." Aug. 22, 1873.

2784.—WILSON, A. F., 18, Buckingham Street, Adelphi, London, "Improvements in apparatus for lighting and extinguishing public and other gas-lamps or lights." Aug. 22, 1873.

2812.—LAKE, W. R., Southampton Buildings, London, "An improved machine for forming the internal screw-threads of gas-fittings." A communication. Aug. 26, 1873.

2813.—KENNELLY, D. J., Inner Temple, London, barrister-at-law, "Improvements in distilling shales, coals, peat, and other bituminous substances, and in the manufacture of peat fuel and peat charcoal in connexion therewith, and in the apparatus employed therein." Aug. 26, 1873.

2822.—SUMMERS, I., Birmingham, builder, "Improvements in apparatus for economizing fuel used for domestic purposes." Aug. 27, 1873.

2834.—MAITLAND, W. H., St. Swithin's Lane, London, engineer, "Improvements in the manufacture of gas, and in apparatus employed therein." A communication. Aug. 28, 1873.

2840.—JOHNSON, J. H., 47, Lincoln's Inn Fields, Middlesex, "Improvements in apparatus for generating hydrogen or carburetted hydrogen gas, and in the means for evaporating the dilute acid employed in generating the gas." A communication. Aug. 28, 1873.

NOTICES TO PROCEED.

1392.—FAULKNER, J. H., Brixton, Surrey, and TATTERS, W., Battersea, "Improvements in measuring or meter taps and valves." April 17, 1873.

1414.—TOOTH, W. H., Sewardstone Road, Middlesex, and TOOTH, W. H., the younger, of the same place, "Improvements in fire-bricks and other articles intended to resist the action of fire, the said improvements including compositions to be used in the manufacture of the same." April 18, 1873.

1552.—NOLDEN, M., Frankfort-on-the-Maine, "An improved method of and apparatus for cleansing water from impurities." April 29, 1873.

2016.—LIVESEY, G. T., South Metropolitan Gas-Works, Old Kent Road, "Improvements in apparatus used in the manufacture of gas." June 6, 1873.

2071.—LEIGH, J., Manchester, "An improved mode of treating sewage and other contaminated waters." June 11, 1873.

2281.—CHAPMAN, L., Collinsville, Connecticut, U.S.A., "Improvements in rotary pumps." July 1, 1873.

2342.—BONNEVILLE, H. A., Paris, "Certain improvements in fluid-meters." A communication. July 7, 1873.

2673.—WAHAB, C. J., Penicuick, Mid Lothian, N.B., "Improvements in sieves and filters." Aug. 12, 1873.

2685.—HARCOURT, A. G. V., Oxford, and FISON, F. W., Ilkley, Yorkshire, "Improvements in the purification of gas, and in the extraction of residual products therefrom." Aug. 13, 1873.

2711.—BARBER, J., and Ingham, J., Romily, near Stockport, "An improved method of and apparatus for effecting the generation of steam in steam-boilers, which invention is also applicable for smelting iron, the manufacture of gas, and other such like purposes." A communication. Aug. 15, 1873.

PATENTS WHICH HAVE PASSED THE GREAT SEAL.

843.—HARRISON, C. W., High Holborn, Middlesex, "Improvements in apparatus for charging or impregnating atmospheric air with the vapour of hydrocarbon liquids." March 8, 1873.

849.—DEAN, H., Southam, Warwick, surveyor, "An improved trap for preventing the ingress of sewer gas into houses and other buildings." March 10, 1873.

1086.—SKOINES, H., 7, Argyle Street, King's Cross, Middlesex, gas engineer, "An improved combined apparatus for manufacturing gas for lighting, heating, and cooking." March 24, 1873.

1765.—HEAP, J., Oldham, "Improvements in screwing tackle, and in apparatus for screwing metal tubes." May 14, 1873.

2177.—HUNTER, A. G., Flint, North Wales, "Improvements in apparatus for the manufacture of gas for illuminating and heating purposes." A communication. June 21, 1873.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

2278.—HARVEY, W., "Improvements in the construction of water-cocks and gas-cocks." Aug. 17, 1870.

2319.—HOLMES, F., "Improvements in pumps." Aug. 23, 1870.

2338.—NEWTON, A. V., "Improvements in liquid-meters." Aug. 25, 1870.

2361.—CHIVERTON, E., "Improved means of and apparatus for lighting gas-lamps." Aug. 29, 1870.

Share List
OF
Metropolitan Gas and Water Companies.

(Corrected by Mr. F. N. Golding, Sun Court, Cornhill, from the latest Stock Exchange Quotations.)

Number of Shares issued.	Amount per Share.	Name.	Amount paid up p. Share.	Dividend p. Cent. p. Annum.	Latest Quotations.
	£	GAS COMPANIES.	£ s. d.	£ s. d.	£
6000	20	Anglo-Romano	20 0 0	10 0 0	22 — 24
5000	20	Bahia (Limited)	20 0 0	3 0 0	9 — 11
1000	20	Do., preference	20 0 0	10 0 0	24 — 26
750	20	Do., do., redeemable	20 0 0	10 0 0	22 — 24
40000	5	Bombay (Limited)	5 0 0	6 15 0	5½ — 6
10000	5	Do., fourth issue	4 0 0	6 15 0	4½ — 5
10000	20	British (Limited) (Norwich, Hull-Sculcoates, Hanley, Tunstall & Shelton [Potteries], Trowbridge., and Holywell.)	20 0 0	10 0 0	32 — 34
7500	20	Cagliari (Limited)	20 0 0	7 0 0	15 — 16
160000	10	*Chartered* A shares	10 0 0	10 0 0	14¼ — 15
20000	10	Do., A	4 0 0	10 0 0	3 — 3½ pm.
10000	10	Do., B shares, 4 per cent. max.	10 0 0	4 0 0	7 — 7½
25000	10	Do., 5 per cent. preference	10 0 0	5 0 0	12¼ — 12½
20000	10	Do., 5 per cent. preference, second issue	10 0 0	5 0 0	12¼ — 12¾
20000	10	Do., 10 per cent. preference	10 0 0	10 0 0	19¼ — 20
42000	25	Do., D shares	25 0 0	10 0 0	48¼ — 49½
17490	100	*Commercial*	100 0 0	10 0 0	154 — 157
20000	20	Continental Union	20 0 0	8 0 0	19½ — 20½
10000	20	Do., new	10 0 0	8 0 0	¼ dis — par
40000	10	Do., new, 1872	2 10 0	8 0 0	¼ dis — ¼ pm.
10000	20	Do., preference (Grmny.: Strsbg. France: Cette, Nismes, Montargis Vienne, Roanne, Beaucaire, Rueil, Albi. Italy: Milan, Genoa, Parma, Modena, Alessandria, Messina.)	20 0 0	7 0 0	23 — 25
5000	10	*Crystal Palace District*	10 0 0	10 0 0	15½ — 16
5000	10	Do., preference	10 0 0	6 0 0	13 — 13½
10000	10	Do., new shares	10 0 0	7 0 0	11 — 11½
23406	10	European (Limited)	10 0 0	8 0 0	13½ — 14
12000	10	Do., new shares (Boulogne, Amiens, Rouen, Caen, Havre, & Nantes.)	5 0 0	8 0 0	2 — 2½ pm.
4054	10	Foreign and Colonial (Limited)	10 0 0	..	9 — 10
5000	10	Hong Kong (Limited)	10 0 0	10 0 0	13 — 13½
1560000	100	*Imperial*	100 0 0	10 0 0	154 —157
26000	12½	Do., new shares	12 10 0	7 0 0	14½ — 15¼
1300	100	Do., bonds	£100	10 0 0	195 —200
56000	50	*Imperial Continental* (Amsterdam, Berlin, Ghent, Hanover, Lille, Rotterdam, Aix-la-Chapelle, Antwerp, Bordeaux, Brussels, Cologne, Frankfort-on-Maine, Haarlem, Stolberg, Toulouse, & Vienna.)	43 15 0	9 2 6	56 — 58
3000	40	*Independent*	40 0 0	10 0 0	65 — 67
3000	10	Do.	10 0 0	5 0 0	7½ — 8½
3000	20	Do.	20 0 0	7 10 0	24½ — 25½
	10	Do., D	1 0 0	..	
250000	Sk.	*London*	100 0 0	10 0 0	153 —156
£15000	Sk.	Do., 1st preference	100 0 0	6 0 0	117 —120
	Sk.	Do., 2nd preference	100 0 0	6 0 0	
	Sk.	Do., 3rd preference	100 0 0	6 0 0	
£18781	100	Do., 1st preference stock	100 0 0	6 0 0	
£11828	100	Do., 2nd preference stock	100 0 0	5 0 0	
15000	5	Malta and Mediterranean (Limited)	5 0 0	5 0 0	3 — 3½
6000	5	Do., preference	5 0 0	7 0 0	5 — 5½
20000	5	Mauritius (Limited)	2 0 0	7 0 0	2 — 2½
25000	20	Monte Video (Limited)	20 0 0	..	22 — 23
8000	10	Nictheroy, Brazil (Limited)	10 0 0	..	2¼ — 2 dis.
30000	5	Oriental (Calcutta)	5 0 0	9 0 0	6½ — 7
30000	5	Do., new shares	2 10 0	9 0 0	⅜ — 1¼ pm.
10000	5	Ottoman (Limited)	5 0 0	nil.	1½ — 2¼
17500	10	Pará (Limited)	10 0 0	7 0 0	7½ — 8½
27000	20	*Phœnix*	20 0 0	10 0 0	31½ — 32½
360000*l.*	100	Do., new	45 0 0	7 10 0	58 — 60 pm.
144000*l.*	Sk.	Do.	100 0 0	5 0 0	90 — 92
5000	20	*Ratcliff*	20 0 0	10 0 0	31 — 32
34000	20	Rio de Janeiro (Limited)	20 0 0	10 0 0	34 — 36
7359	5	Singapore (Limited)	5 0 0	7 10 0	4½ — 5
2000	5	Do., preference	5 0 0	7 10 0	5½ — 6
1500	32½	Shanghai	32 10 0	12 0 0	30 — 32
4000	50	*South Metropolitan*	50 0 0	10 0 0	83 — 85
4000	12½	Do.	12 10 0	10 0 0	20 — 21
20000	12½	Do., new shares	2 10 0	10 0 0	3¾ — 4¼ pm.
15000	10	*Surrey Consumers*	10 0 0	10 0 0	15¼ — 15¾
10000	10	Do., new	7 0 0	10 0 0	4 — 4½
9000	4	United General (Limerick)	4 0 0	2 10 0	1¾ — 2¼ pm.
1500	10	*Wandsworth and Putney*	10 0 0	10 0 0	14 — 15
1500	10	Do.	10 0 0	7 10 0	11 — 12
2957	10	Do.	10 0 0	7 0 0	
993	10	Do.	3 0 0	7 0 0	
16000	5	*West Ham*	5 0 0	10 0 0	7¾ — 8¼
10000	5	Do., new shares	1 10 0	10 0 0	3 — 3¼ pm.
		WATER COMPANIES.			
60000	10	Berlin	10 0 0	11 10 0	18 — 20
12000	100	Chelsea	100 0 0	6 0 0	117 —119
18000	100	East London	100 0 0	6 0 0	121 —123
10000	50	Grand Junction	50 0 0	8 10 0	77 — 79
5840	25	Do., ⅛ shares	25 0 0	8 10 0	38 — 39
2160	25	Do., new do.; maximum dividend, 7⅛ per cent.	25 0 0	7 10 0	31 — 33
4396	100	Kent	100 0 0	6 0 0	120 —122
5339	100	Lambeth	100 0 0	6 5 0	120 —122
1161	100	Do.	20 0 0	6 5 0	
442	100	New River	100 0 0	8 0 0	170 —180
4443	100	Do.	20 0 0	8 0 0	36 — 38
4000	100	Do., debenture stock, 4 per cent.	100 0 0	4 0 0	96 — 98
3036	100	Southwark and Vauxhall	100 0 0	5 10 0	103 —105
1296	100	Do., preference stock	100 0 0	5 0 0	101 —103
	100	Do., D shares	100 0 0	5 10 0	101 —102
		Do.	..	4 10 0	
	100	Do., new ordinary	..	4 10 0	
1600	100	Do., new ordinary, No. 1	40 0 0	4 10 0	
13913	61	West Middlesex	61 0 0	£6 per sh.	120 —122

Price Current.

CASTINGS.—*Per Ton.*
Average Weight of Cast-iron Gas-pipes, per Yard.

1 in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lbs.

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow.	Newcastle and Middlesboro'.	Wales.	Yorkshire, Derbyshire, and Staffordsh.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Pig Iron, No. 1 (g.m.b.)	—	5 7 0	6 7 6	6 10 0	6 5 0
1½ and 2 inch Socket-pipes	11 0 0	10 10 0	10 10 0	10 10 0	10 10 0
2½ and 3 inch do.	10 10 0	9 15 0	9 10 0	9 15 0	9 15 0
4 and 5 inch do.	10 0 0	9 10 0	9 0 0	9 10 0	9 10 0
6 inches and upwards, do.	9 10 0	9 0 0	8 17 6	9 0 0	9 0 0
Retorts, 1st fusion, hot blast	10 10 0	9 15 0	10 15 0	9 15 0	9 15 0
Do., 2nd do., cold do.	—	—	—	—	—
Tank Plates, ⅜ thick and above	11 10 0	15 0 0	11 0 0	11 0 0	16 0 0

WROUGHT-IRON TUBES AND FITTINGS.
(Subject to 25 per cent. discount.)

Internal Diameter in Inches.	2	1½	1¼	1	¾	½
TUBES.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Assorted, 2 to 14 feet, per foot	1 9	1 2	0 11	0 8	0 6	0 4½
Pieces, 12 to 23½ inches, each	3 0	2 0	1 8	1 4	1 0	0 9
Do., 3 to 11¼ do.	2 3	1 4	1 1	0 11	0 8	0 6
Longscrews, 12 to 23½ do.	4 0	2 6	2 0	1 6	1 2	0 11
Do., 3 to 11¼ do.	3 0	2 0	1 3	1 0	0 10	0 8
Bends and Lamp Bends	4 3	2 3	1 9	1 3	0 11	0 8
Springs, various elevations	3 3	1 8	1 4	0 11	0 9	0 7
FITTINGS.						
Square Elbows, equal or reducing	3 6	2 3	1 9	1 2	0 10	0 8
Round Elbows	3 10	2 6	1 11	1 4	1 0	0 9
Tees, equal or reducing	3 9	2 6	1 2	1 3	1 0	0 9
Crosses, do.	5 3	3 6	3 0	2 3	1 9	1 5
Sockets, reducing	1 3	0 11	0 9	0 7	0 6	0 5
Caps and Plugs	1 3	0 10	0 8	0 6	0 5	0 4
Nipples and Backnuts	1 0	0 8	0 6	0 4	0 3½	0 3
Sockets, plain	1 0	0 7	0 6	0 4	0 3½	0 3
Iron Main-Cocks	18 0	11 0	8 6	6 6	4 6	3 6
Syphon Boxes, 2 quarts	23 0	19 0	18 0	17 0	16 9	—

LONDON METAL MARKET.—*Per Ton.*

	£ s. d.		£ s. d.
Copper, tough cake	88 0 0	Tin, English block	129 0 0
Iron, Welsh bar	12 0 0	Tin-plates, best coke I. C.	1 13 0
Lead, English pig	23 0 0	Spelter, foreign	26 0 0

FREIGHTS.

COASTWISE.—*Per Ton.*

Newcastle—	s. d.	s. d.
Chatham and Rochester		—6 9
Cork (per keel) £10	0 0	——
Dover, Folkestone, and Ramsgate		—7 3
Dublin		——
Exeter Quay		——
Ipswich		—6 6
London (from Leith)		—7 0
London (Pool)		—6 6
Lowestoft and Yarmouth	5 6	—5 9
Portsmouth and Southampton		—8 3
Plymouth (per keel) £9	5 0	——
Shoreham		—7 6
Whitstable		—7 6
Weymouth		—8 0

FOREIGN.—*Per Keel.*

	£ s.	£ s.
Barcelona	.19	0—19 10
Bordeaux		— 9 10
Boulogne and Calais	. 8	15— 9 0
Cadiz		—11 0
Cronstadt		— 6 0
Copenhagen		— 8 10
Genoa		—18 0
Hamburg		— 8 0
Havre de Grace		—10 0
Leghorn		—18 10
Lisbon		—10 10
Rotterdam		— 9 5
Stettin		— 9 5
Trieste		—22 0
Venice	.23	0—24 0

GAS COALS.—*Per Ton.*

Scotch Cannels, f.o.b.—	s. d.
Boghead, at Bo'ness	77 6
Capeldrae, at Burntisland	53 8
Cowdenbeath, do.	—
Donnibristle, do.	32 0
Kirkness, best, do.	53 8
Lesmahago (Auchin.), at Granton	46 0
Do. (Duke of Hamilton's), do.—	
Main	43 6
Wee	46 0
Do. (Nitshill Co.'s), do., and at Glasgow	47 6
Lochgelly, at Burntisland	—
Milton and Crosshill	38 8

Scotch Cannels, f.o.b.—	s. d.
Arniston, at Leith	40 0
Billeyford, at Leith	26 0
Elphinstone Tower, do.	30 0
Grange Cannel, at Bridgeness	—
Haywood, at Granton	—
Kinniel, at Bo'ness	35 0
Lanemark, at Glasgow	—
Lochore, at Burntisland	53 8
Myles' do.	—
Pirnie, at Methill	26 6
Waverley Seam, at Burntisland	—
Old Wemyss Cannel, at Wemyss	45 0
Wemyss Rhumes Cannel	22 6

Newcastle (Unscreened)—	Per Ton.
Haswells, Nettlesworth Primrose, and South Pelaw	—
Felling, Framwell Gate, North Pelton, Walker's Primrose, West Wear, and Whitwell Primrose	—
Burnhope, Charlaw, Derwent, East Castle, Edmondsley, Eighton Moor, Hartlepool Pelaw, Holmside, Lambton's Gas, Lanchester Pelaw, Medomsley, Mickley, New Pelaw, Pelaw Main, Pelton Main, Ravensworth, Seaham, South Moor Pelton, South Leverson, Townley Main, West Pelaw, Wearmouth Hutton, and Witton	—
Peareth, Ravensworth Pelaw, Waldridge, West Garesfield, and West Pelton	—
Brancepeth, Dean's Primrose, Londonderry Gas, New Pelton, South Peareth, Urpeth, Washington, and West Leverson	—
Ramsay's Newcastle Cannel	40 0
Wigan Cannel, f.o.b. at Liverpool	40 0

CHEMICALS.

Ammonia—	£ s. d.
Sulphate, white and grey	17 10 0
Do., brown, 23 per cent.	15 15 0
Benzole, 30 per cent.	0 2 3
Carbolic acid	0 1 1

Iron Salts—	£ s. d.
Green and rusty Copperas	3 10 0
Dry do.	2 15 0
Sulphuric Acid	3 10 0

SUNDRIES.

	£ s. d.	£ s. d.
Best Newcastle Fire-bricks, per 1000		— 4 0 0
Do., Fire-clay Retorts, per foot run	0 7 0	— 0 7 6
Cliff's Fire-bricks, at Wortley, per 1000		— 3 10 0
Ingham's best Wortley Fire-bricks, on rail or boat, per 1000		— 3 10 0
Farnley Iron Co.'s Fire-bricks, do., do.		— 3 10 0
Wortley Fire-clay Retorts, per foot run	0 5 6	— 0 7 6
Tarred Rope Yarn, per cwt.		—
Fraser's best Fire-bricks, f.o.b. at Inverkeithing		— 2 10 0
Do. Retorts, per foot run	0 5 0	— 0 7 6
Do. Ground Fire-clay, per ton		— 0 10 0
Stourbridge Fire-bricks, per 1000		— 3 0 0
Do. Fire-clay, per ton		— 0 12 0

AN AMERICAN VIEW OF THE COAL QUESTION.—The growing scarcity of gas coal in Europe is of vast importance to us, inasmuch as we are likely soon to monopolize the near markets, and this will yield to increased activity in our business relations with them. Not to speak of the countries on the Pacific, where, neither in China nor in Japan, nor in the Island of Formosa, nor in Australia or New Zealand, gas coal has been discovered, the field nearest at hand, Spanish America and the Brazils, is of vast importance to us already. The sudden rise in the value of certain products, especially coffee, hides, and copper, has during the past two years enriched all South and Central America; and the people are launching out in local improvements and luxury on a scale only equalled by the lavishness of Cuban sugar planters ere the present insurrection broke out. Municipal and private establishments, such as we possess in our third-class cities, are becoming the order of the day in Spanish America and the Brazils. The people have the money, and they mean to spend it. Private residences within the cities of those countries mostly originate from the times of the old viceroyalties; they are tall, majestic piles of masonry, built on a liberal plan, with the Moorish *patio*, or court-yard, uncovered in the middle, and to light the vast apartments a great deal more gas is consumed than in American private residences on a like scale. Their streets and public squares are on the same spacious plan, and so are the theatres. Hence, the consumption of gas *per capita* in a Spanish American city of the first or second rank is about three times what it is in an American city of the same size, the more so as social intercourse is a great deal more animated after sunset in those warm latitudes than what it is the year through in the generality of our States. This will suffice to show the importance of the new customers we shall have to supply henceforward and alone. The railroads leading to tidewater from the coal regions will, of course, reap the benefit from this sudden increase of business relations, the more so as our next-door neighbours have commenced to use our ordinary coal also in large quantities for the past six or eight months, Canada vieing with us in supplying them, yet a goodly portion falling to our share. It is to be presumed therefore, that more than ever we shall be canvassing the localities whence all this coal for gas purposes is to be drawn, and unless we are able to extract it fast enough to meet requirements, the inference is that such coal, now commanding the moderate figure of 9 dols. per ton, will in the course of time attain a considerably higher market value. *Apropos* to this important crisis in the coal trade, we have the prospect of an inexhaustible supply being made at once available by the opening of the Chesapeake and Ohio Railroad. That line runs through the heart of a coal and iron field, which in its extent, its richness, and its variety of these minerals is probably unequalled by anything yet discovered in any part of the world. Its supply of gas coal is inexhaustible; and experiment has demonstrated that its yield of gas is equal to that of the best English coal. These deposits lie on the route of direct water communication *viâ* the Ohio and the Mississippi to the Gulf of Mexico, and are within a moderate distance, *viâ* the Chesapeake and Ohio road, of the Chesapeake Bay, thus having the advantage of the shortest possible routes to the West Indies and to Central and South America. It seems inevitable that this must become the great source of coal supply to countries which have hitherto drawn their gas coal almost entirely from Great Britain. This prospect is encouraging, not only to an important railroad enterprise and to an hitherto neglected mineral region, but also to our mercantile marine, long in a state of decadence. Our great difficulty hitherto in contending for the carrying trade of the West Indies and South America has been that vessels going thither from our ports could not find paying outward freights, but with a constant outflow of coal, and possibly also of manufactured iron (for the two are apt to keep close company), this difficulty would be obviated, and, with distance in our favour, there seems to be no reason why we should not, under the changed conditions which seem to be in process of evolution, control within a few years this very important branch of the ocean carrying trade. Thus the causes are already beginning to work, which must before long transfer the commerce of the Antilles and of Central and South America from Europe to the United States.—*New York Bulletin.*

GAS MANAGER'S HANDBOOK,

BY

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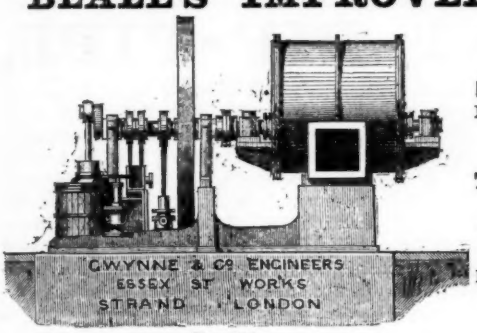

FIG. 224.

WITH

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PATENT

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GAS-EXHAUSTING MACHINERY.

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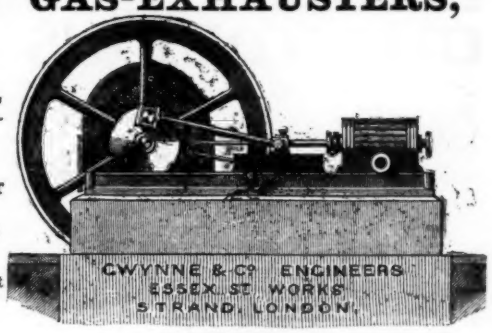

FIG. 225.

Fig. 224 represents one of those erected at the Imperial Gas-Works, Bromley, capable of passing 210,000 cubic feet of gas per hour. These Patent Machines combine the highest quality of workmanship and materials, the largest bearings and wearing surfaces, with the **most perfect system of action yet discovered.** Fig. 225 represents one of a series of four at the Nottingham Gas-Works, each passing 52,500 cubic feet per hour. GWYNNE AND Co. do not pretend to enter into a struggle with other makers in respect to **cheapness.** They have never sought to make **price the chief consideration,** but to produce Machinery of the very highest quality, and the most approved design and arrangement. Their prices have been estimated with a due regard to the **excellence of the article produced,** and when this is taken into consideration, they have no fear for the result.

The orders executed this season for Exhausters and alterations to their patented system, amount to over 3,000,000 cubic feet of gas passed per hour, and to over 200 horse power for Engines to drive them. In every instance their work is giving the greatest satisfaction.

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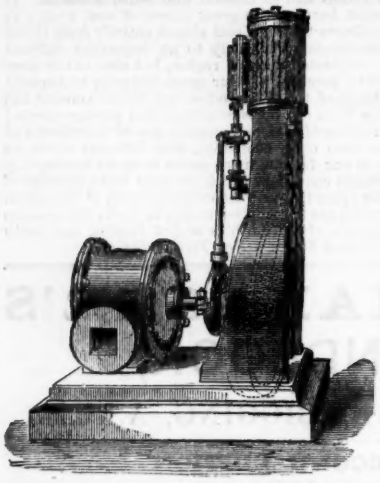
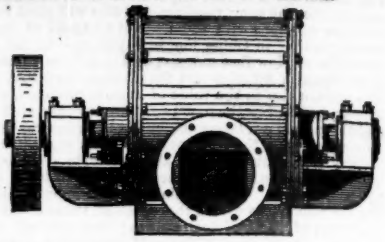


WITH

ENGINE COMBINED

ON

ONE BASE PLATE.



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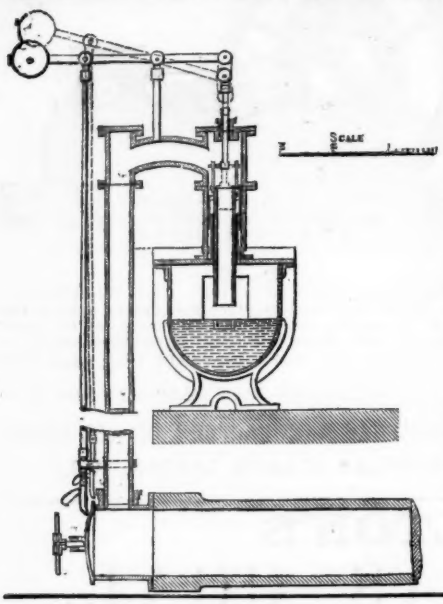
CHANDLER'S PATENT DIP-PIPE.



It is well known by all Gas Managers that back pressure upon the retorts greatly retards the production of gas, causing a deposit of carbon which keeps steadily accumulating. Such carbon reduces the capacity of the retorts, requires extra fuel for heating, and has to be frequently removed by heavy iron bars, which very much injure the retorts. By the use of Chandler's Patent Dip all these evils are entirely remedied. When the retorts are being drawn and charged, the Dip-Pipe is sealed in the fluid of the hydraulic main. As soon as the lids are replaced, the Dip is raised completely out of the fluid, and the gas passes unrestricted to the holders. By running the exhauster to a level gauge, ALL PRESSURE IS REMOVED FROM THE RETORTS. The consequence is that there is no deposit of carbon, no need of scurfing, no extra fuel is required, a large saving of wear and tear and loss of time is effected, and a greatly increased production of gas per ton of coal is realized.

The following testimonial letter has been received from the manager of the Erith Gas-Works :—

Messrs. Chandler and Sons.

Gentlemen,—I beg to inform you that during last week I carbonized 18 tons 5 cwt. of Ravensworth Pelaw Coal in a single setting of retorts fitted with your Patent Dip-Pipes, and obtained a yield of 195,800 feet of gas, equal to 10,730 feet per ton, which is a considerably greater yield than I have been able to obtain before using your Dip. The single retort fitted with your Patent Dip, which has now been in use here upwards of four months, has been throughout, and is now, quite free from carbon. I am, gentlemen, &c.,

Erith Gas-Works, Aug. 2, 1873. (Signed) D. VINCENT, Manager.

For terms of use and cost, apply only to the Patentees,

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WANTED, a situation as Manager of a small town Gas-Works, or as MANAGER of Gas and Water Works in a private or public establishment. Can have good references and testimonials as to character, abilities, and experience.
Apply to J. H., Water-Works, EPSOM.

TO GAS COMPANIES.

WANTED, by a young man, a situation as GAS-FITTER. Can repair meters and do smith's work if required, take the registering of meters, and keep books. Good reference.
Apply to J. P., Mr. Couchman's, 85, Abbey Road, ST JOHN'S WOOD, N.W.

WANTED, by the Advertiser, aged 28 (at present with a large Gas Company, and having ten years experience), a situation as MANAGER. Unexceptionable testimonials and references. Uses the photometer. No objection to go abroad.
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WANTED, by an experienced and thoroughly competent young man, an appointment as wet and dry METER REPAIRER. Good tinman, and well up in meter testing and gas-fitting, and has a knowledge of the practical working of a gas-work. Fourteen years experience.
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WANTED, in a provincial Gas-Work, the services of a gentleman as ASSISTANT ENGINEER. He must be of active business habits, a good draughtsman, thoroughly acquainted with the modern principle of making and purifying gas, and have been accustomed to the management of workmen. Salary £200 per annum.
Apply by letter, stating age and qualifications, to ENGINEER, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C., on or before the 17th inst.
Sept. 5, 1873.

FOREMAN.

WANTED, for a provincial Gas-Work, where the make of gas is about 100 million feet, a WORKING FOREMAN. He must be well acquainted with the working of exhausters, engines, and pumps, and will also be required to do main and service laying, and attend generally to keeping the works in good working order.
Applicants to state wages expected. House on the works, with coal and gas free. Strict sobriety absolutely essential.
Applications to be addressed to X. Y. Z., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.
Sept. 4, 1873.

COOKING AND HEATING BY GAS,
BY
MAGNUS OHREN, A.I.C.E.

NEW AND REVISED EDITION.

Prepared for Gas Companies to circulate amongst their gas consumers.
£1 per 100; £3 15s. per 500; or £6 per 1000.
Address, MAGNUS OHREN, Gas-Works Lower Sydenham, London, S.E.

COST PRICE SHEETS.

MANUFACTURE AND DISTRIBUTION OF GAS. These sheets are the same as were laid before the Dublin Meeting of the British Association of Gas Managers; but in the REPRINT, NOTES have been added for the guidance of those using them. Copies of the two sheets may now be had, price 5s.
South Shields, January, 1873. W. J. WARNER.

MR. NORWOOD EARLE, late of the Dover Gas-Works, is prepared, after 17 years experience, to undertake the duties of SURVEYOR to Gas Companies and Corporations in all matters relating to the Distribution of Gas and Gas Testing. Contracts entered into for the Survey of Mains, Services, Public Lamps, &c., in order to reduce the per centage of unaccounted-for gas to the lowest possible amount.
Valuations for Assessment, Transfer, and other purposes.
Offices, MANSION HOUSE CHAMBERS, 12, Queen Victoria Street, LONDON, E.C.

WANTED to Purchase, a second-hand STATION-METER, in good order, with bye-pass, &c., to pass 8000 to 10,000 cubic feet per hour.
Apply to the HOLYWOOD GAS COMPANY, County Down, IRELAND.

SOUTH AMERICA AND JAPAN.

AN Engineer who, in November, will start on a commercial journey to the principal cities of South America, Japan, China, India, and Egypt, will be glad to represent a first-class firm manufacturing Machinery or Apparatus connected with gas.
For terms, address ENGINEER, care of Mr. G. Street, 30, Cornhill, LONDON, E.C.

WANTED, a second-hand Station-METER, in perfect order. Inlet, 3 to 4 in.
Apply to L. B., Messrs. W. Porteous and Co., Advertising Agents, GLASGOW.

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TO BE SOLD, a 30,000 feet per hour Beale's EXHAUSTER, with inlet and outlet valve.
Apply to S. STUDHOLME, Engineer, Old Gas-Works, WHITEHAVEN.

METER FOR SALE—A Meter con-structed to pass 900 feet per hour.
Apply to the MANAGING DIRECTOR, Risca and Pontymister Gas Company, Bank Chambers, Newport, MONMOUTHSHIRE.

HALIFAX CORPORATION GAS-WORKS.

TO BE DISPOSED OF—Six 16-inch FOUR-WAY ANDERSON VALVES, with fittings complete.
The above (replaced by 20-inch) are in good working order.
Apply to Mr. MALAM for any further particulars.

TO BE DISPOSED OF, in consequence of being replaced by larger ones, a pair of 6 H.P. VERTICAL ENGINES, with oscillating cylinders, and a pair of 20,000 feet per hour ROTARY EXHAUSTERS, with some valves and connexions.
The above are in good condition, and will be sold together or separately. Price, for the whole, £130.
Apply to W. C. WATSON, Engineer, Gas-Works, KINGSTON-ON-THAMES.

GAS LIQUOR AND TAR.

TENDERS are required for about 15,000 butts of LIQUOR and 700,000 gallons of TAR, to be delivered free to a wharf in London (in tank barges) during the next two years. Cash monthly.
Sealed tenders, endorsed "Tenders for Tar, &c.," to be sent to WILLIAM DIGHT, Esq., 2 & 3, PHILPOT LANE, E.C., on or before the 22nd inst.
The right is reserved of rejecting any tender.

TO MANUFACTURING CHEMISTS AND OTHERS.

THE Brighouse Local Board are pre-pared to receive TENDERS for the surplus TAR and AMMONIACAL LIQUOR manufactured at the Gas-Works for one year, from the 1st of October next.
Particulars as to quantities, &c., may be learnt on application, and sealed tenders, at per ton, on the works, must be sent in or before the 25th proximo, addressed to the Gas Committee. By order,
JAMES RILEY, Manager.
Dated this 23rd day of August, 1873.

THE NEW GAS COMPANY, LIMITED.

THE Directors of the above Company are ready to receive APPLICATIONS from owners of existing Gas-Works, as well as from others erecting or about to erect new works, and to grant Licences for the use of the Patents.
Apply to the SECRETARY, 22, WALBROOK, E.C.

TO IRONMASTERS AND OTHERS.

THE Directors of The Gaslight and Coke Company are prepared to receive TENDERS for the supply of IRONWORK for their Retort and Purifying Houses now in course of construction at the Company's Beckton Station, in accordance with a specification to be obtained at this Office on payment of the sum of 5s.
By order,
JOHN ORWELL PHILLIPS, Secretary.
Chief Office, Horseferry Road,
Westminster, S.W., Aug. 30, 1873.

AMMONIACAL LIQUOR.

THE Directors of the Gloucester Gas Company invite TENDERS for all the AMMONIACAL LIQUOR produced at their works for One year, from the 1st of October next. Offers to be at a rate per ton of 220 gallons according to strength, from five degrees (Twaddle) as the minimum, and advancing at a rate for each half degree increase.
The liquor can be delivered into contractor's boats on the river Severn, in front of the works.
Offers to be given in on or before the 26th day of this month.
The Directors do not bind themselves to accept the highest or any offer.—By order,
R. MORLAND, Engineer.
Gloucester, Sept. 4, 1873.

PHOTOGRAPHS of the "British and North British Associations of Gas Managers," taken at Tarbet, Lochlomond, on Thursday, June 12, 1873, may be had from JOHN STUART, 120, Buchanan Street, Glasgow. Price, per post (on roller), 3s. each.

CRYSTAL PALACE DISTRICT GAS COMPANY.
NOTICE is hereby given that the ORDINARY HALF-YEARLY GENERAL MEETING of this Company will be held at the London Tavern, Bishopsgate Street, London, on TUESDAY, the 23rd of September inst., to receive the Report of the Directors, the Balance-Sheet confirmed by the Auditors, to declare a Dividend, and for general business.
The Chair will be taken at half-past Three o'clock precisely. By order of the Board,
MAGNUS OHREN, Secretary.
Lower Sydenham, S.E., Sept. 6, 1873.

COMMERCIAL GAS COMPANY.—NOTICE is hereby given that the next ORDINARY MEETING of the Company will be held at the London Tavern, Bishopsgate Street, in the City of London, on FRIDAY, the 3rd day of October next, at Twelve o'clock at noon, to receive the report of the Directors, and to declare a Dividend to the 30th day of June last.
The Books of the Company will be closed for the Transfer of Stock from the 18th day of September to the 3rd day of October now next ensuing.
By the Company's Act of Incorporation, the holders of Stock can inspect the Books of the Company during one fortnight before and one month after the Meeting.
By order of the Board,
GEORGE JAQUES, Secretary.
Stepney, Sept. 2, 1873.

CONSULTING ENGINEER.

MR. HENRY GORE, C.E., will retire from his present appointment (which he has held for the last five years) early in October, after which date he will be open to accept engagements to act as Consulting Engineer and Scientific Referee on all matters relating to Gas and Water Supply.
Mr. Gore has had special experience in connexion with parliamentary and other public inquiries, arbitrations, and valuations, both in this country and abroad.
Plans and specifications prepared for the erection, alteration, or improvements to works, including Mr. Gore's improvements in setting retorts.
First-class references, including the firm Mr. Gore is now leaving.
Address, 9, Islip Street, Kentish Town, LONDON, N.W.

AN ANALYSIS OF THE
METROPOLITAN GAS COMPANIES ACCOUNTS for 1872.
Compiled and arranged by JOHN FIELD,
Chief Accountant to the Imperial Gas Company.
Can be obtained from the AUTHOR, at 26, Arundel Square, Islington, N., per post; or of EDEN FISHER, Stationer, 50, LOMBARD STREET, E.C. Price £1 1s.

Demy 16mo., Sixty-four pages,

ADVANTAGES of GAS. By J. O. N. RUTTER. A new edition.—201st Thousand.
Brighton: Published by the Author.
This little book is intended for distribution by Gas Companies and the manufacturers of gas apparatus. It has done good in making known the benefits and promoting the sale of gas; and it is hoped that its usefulness might be continued and greatly extended.
Prices:—1000 copies, £8; 500 copies, £4 5s.; 250 copies, £2 5s. Any smaller number at 20s. per 100 copies.
A specimen copy free per post for three penny stamps. Covers printed specially.
Apply to J. O. N. RUTTER, Black Rock, BRIGHTON.
Nov. 13, 1871.

In the press, and will shortly be published,

THE GAS CONSUMER'S MANUAL;
OR,
How to obtain Good Light and Cheap Gas.
Being a Popular Exposition of the Chemistry of Gas Lighting, with Practical Instructions in the best methods of burning Gas for Lighting, Cooking, and Heating; and Suggestions as to the proper Sizes of Interior Pipes, Arrangement of Lights, &c., &c.
ILLUSTRATED.

ALSO,

ON SETTING AND WORKING RETORTS.
A Revised and Illustrated Reprint of a Paper read at the Annual Meeting of the British Association of Gas Managers in 1870.
By E. S. CATHELS, Assoc.Inst.C.E., Montreal, Canada.

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THE TWENTY-FIRST VOLUME
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UNDER one or the other of their Patents, Machines can be adapted to almost any existing works without material alteration of the Retort-Houses or Settings.

Applications, accompanied by full particulars as to dimensions of the Retort-Houses, Settings of the Retorts, &c., &c., should be addressed to the Secretary, at the Offices of the Company,

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Mr. ALFRED LASS,
60, CORNHILL, LONDON, E.C.,

Is prepared to open the Books, and, if necessary, keep the Accounts of Gas and Water Companies.

To examine the Books and Accounts, and prepare Balance-Sheets for the information of Directors.

To assist Secretaries in preparing Balance-Sheets, according to the "Gas-Works Clauses Act, 1871;" or may be consulted with respect to Accounts generally.

SAMUEL PONTIFEX, Consulting Gas Engineer, having retired from the Great Central Gas Company, is now prepared to furnish PLANS and SPECIFICATIONS, as well as ADVISE Provincial Gas Companies as to the erection of new, or alteration and enlargement of existing works.

Offices: 22, Coleman Street, LONDON, E.C.

REMOVAL.

MR. ALFRED PENNY, C.E., begs to give notice that he has REMOVED his Offices from the Wenlock Iron-Works to No. 20, ABINGDON STREET, WESTMINSTER, where he may be consulted as usual on all matters connected with Gas-Works, Water-Works, and Drainage, both for England and Abroad.

MR. WILLIAM DORE (19 years Gas Engineer and Accountant) may be CONSULTED upon all matters relating to the manufacture and distribution of gas, and the management, accounts, or transfer of gas undertakings.

Office, 4, Picton Place, Neath, SOUTH WALES.

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Manufactory for every description of Casting and Machinery for Gas-Works and Water-Works.

Warehouse in London for Cast-Iron Pipes and Connexions of all sizes and in any quantity, Scott's Wharf, Bankside, Southwark.

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Plain, Turned and Bored, and Coated.
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EXHAUSTERS.

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MANUFACTURERS OF
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NEAR
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HYDRATED PEROXIDE OF IRON (BOG OCHRE),
Same quality as supplied by us to several of the most extensive Gas Companies, and which has given entire satisfaction.
FRANCIS RITCHIE & SONS,
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SOLE AGENT FOR
EDGE'S PATENT
FOR REMOVING THE
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All kinds of Gas-Works Apparatus and General Castings made to Pattern or Drawing.

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MR. ANDERSON advises Companies on all matters connected with the manufacture of Gas and the construction of Works.

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RETORT SETTINGS, heated by tar without the production of smoke.
STEAM-ENGINES and EXHAUSTERS, separately or combined.
FOUR-WAY VALVES, one of which is equal to three ordinary Valves.
STATION GOVERNORS—the Gasholder cannot tilt and cause accident.

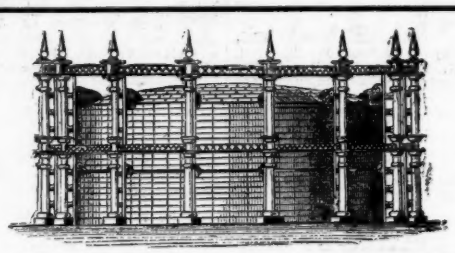
BREEZE AND TAR FUEL MACHINE.

A Pamphlet containing Eighteen Illustrations of the foregoing, with letterpress on the construction of Works, post free, 2s. 6d.

N.B.—The second edition of this Work, *now ready*, contains illustrations of the Machine for converting Breeze and Tar into Fuel for heating the Retorts.

"The Author is well qualified to speak authoritatively upon the important subjects to which his pamphlet refers."—*Artizan.*

HOPE IRON WORKS,



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GAS APPARATUS OF EVERY DESCRIPTION,

Including Improved

Retort-Lids, Boilers, Cast and Wrought Iron Tanks, Iron Roofing, Bridges, Girders,

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N.B.—Estimates for all Gas Plant and Remodelling supplied on application.

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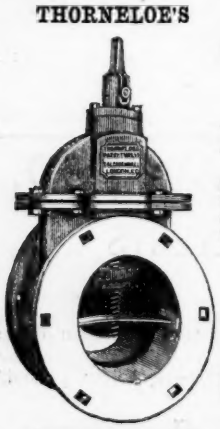

PATENT VALVE.

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SOLE MAKERS OF
CHANDLER AND SON'S
PATENT REGULATING DIP-PIPE.

Copy Testimonial.—A series of experiments have taken place at the Erith Gas-Works with "Chandler's Patent Dip-Pipe," which was found to prevent any deposit of carbon taking place at the back or on the surface of the clay retorts; there was also considerable increase of gas per ton of coal carbonized, whilst the apparatus continues working with the greatest simplicity and certainty.

Prospectus, with Price Lists and Particulars, on Application.

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For GAS and WATER, from 3 to 24 inches,
SUPPLIED FROM STOCK.

They are now in use at the following Gas-Works in London:—PHŒNIX and SOUTH METROPOLITAN; also at Aylesbury, Aldershot, Colchester, Farnham, Guildford, Leicester, Ilford, Middlesboro' Patent Gas Company, Reading, &c.

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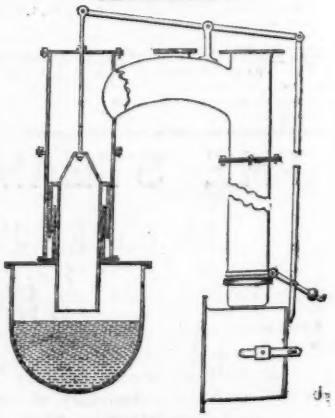

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Gas-Meter, Gas Apparatus, and Gas-Fittings Manufacturers,

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And every description of Gas-Fittings and Gas Apparatus.

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PATENT PLATINUM

GASLIGHT PERFECTER.

Extract from Report by Dr. Letheby:—

"The results have been very remarkable, for they show an average increase of 63 per cent. on the illuminating power of the gas. I am of opinion, therefore, that the invention is of great practical value."

Extract from Dr. Frankland's Course of Lectures at the Royal School of Mines, February, 1868.

"Scholl's Platinum Perfecter is one of the most important inventions of modern times in connexion with the burning of coal gas."

Price 1s. each for Fishtail Burners.

To be had retail of Gas-Fitters and Ironmongers.

JOHN SCHOLL, Manufactory: 41 & 42, BERWICK STREET;

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Terms on application. N.B.—A specimen sent free on receipt of Twelve stamps.

*** Further testimonials from Drs. Frankland and Crooks, showing the great practical value of this invention, will be shortly published.

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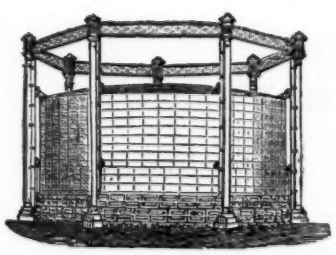

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INTERNATIONAL EXHIBITION, 1862.

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For excellence of Fire-Clay Gas Retorts, and

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BRONNER'S PATENT GAS-BURNERS give 99 per cent. of light, as compared with 27 per cent. given by ordinary burners, with equal consumption of gas.—*Vide* "Gas Referees Report," published June, 1869.

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CATHELS & TERRACE'S Patent Four-WAY DISC GAS-VALVE is the simplest and best Valve for Purifiers, and as a By-pass for other apparatus in Gas-Works. It is always gas-tight, and has no springs, ground faces, or other delicate parts. By its use the flow of the gas cannot be accidentally stopped, and it never sticks.

For prices, &c., apply to the Manufacturers, Messrs. GUEST AND CHRIMES, Foundry and Brass Works, ROTHERHAM.

CATHELS'S Patent District Dry Gas-GOVERNOR is the only perfect self-acting contrivance for Regulating the Pressures in the higher levels of a district.

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NEAR NEWCASTLE-UPON-TYNE,

Manufacturer of Clay Retorts, Fire-Bricks and every description of Fire-Clay Goods.

CLAYTON'S PATENT SIX-WAY VALVE only requires one valve to work two purifiers; saves more than three-fourths of the connexion-pipes; requires neither tees, elbows, nor bends; no racks or springs to get out of order.

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TO GAS COMPANIES, ENGINEERS, &c.

WOOD SIEVES.—WOOD SIEVES.

Estimates given and Contracts taken by the Manufacturer

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These Sieves are made with parallel or bevel bar, and guaranteed to be well seasoned yellow deal, and not common spruce so generally used.

N.B.—Specimens sent free on application.

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Beg to inform Gas and Water Companies and the public, that they keep in stock in London all the CASTINGS in general use in Gas and Water Works, including Iron Retorts, Socket and Flange Pipes, Bends, Branches, and Syphons of all sizes, Lamp Columns, &c., &c.

N.B.—Orders for Cast-Iron Tanks, Girders, Columns, Cylinders, and all irregular castings, will have immediate attention. CHARLES HORSLEY, Agent.

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CONTRACTING ENGINEER

FOR

GAS & WATER WORKS,

GREAT BERKHAMPSTEAD, HERTS.

Foreign Orders carefully executed. Provincial Gas-Works designed and erected. Extensions of Works carried out with despatch. Mains supplied and promptly laid. Public and Private Buildings fitted up. Gasholders, Purifier Covers, and all Sheet Ironwork. Wrought Ironwork to drawing.

Specifications, Estimates, and Tenders given.

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FACTORIES:

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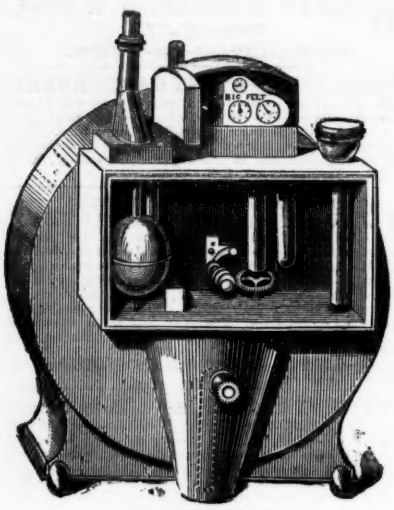


Front View.

THE

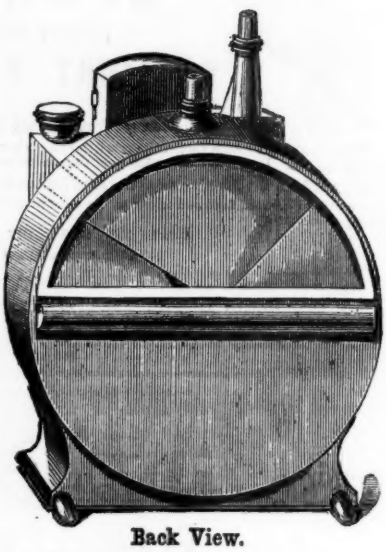
IMPERIAL

COMPENSATING

WET GAS-METER.

DE CASTRO & BURTON'S

PATENT.



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I. This Meter is more simple in construction than the common non-compensating Meter.
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III. No amount or kind of pressure will cause it to "flood."
IV. It is practically unaffected by "tilting."
V. The friction is less than in any other Meter; and
VI. It will last for twelve months without requiring to be refilled.

THE IMPERIAL METER COMPANY, LIMITED, ALSO MANUFACTURE COMMON NON-COMPENSATING WET GAS-METERS OF ALL SIZES, BOTH IN TIN AND CAST-IRON CASES.

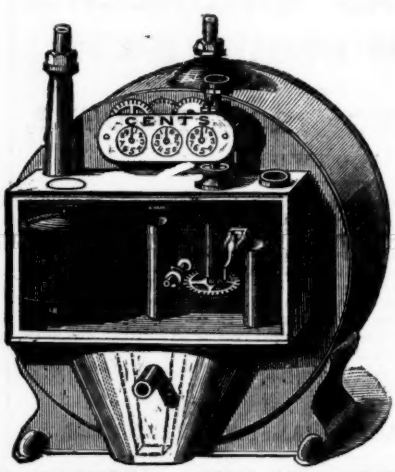
THE COMPENSATING

WET GAS-METER

IS UPHELD FOR

TEN YEARS

WITHOUT CHARGE.



THE IMPERIAL WET GAS-METER.
Non-Compensator.

STATION-METERS

WITH PLANED JOINTS,

AND

GOVERNORS,

MADE TO ORDER.

Mr. GEORGE MACKANESS will represent this Company in the Provinces.

OFFICES: 41, FLEET STREET, LONDON, E.C.

W. MOORE, Secretary.

☞ *All Communications to be addressed to the Secretary.*

THE IMPERIAL METER COMPANY, LIMITED,

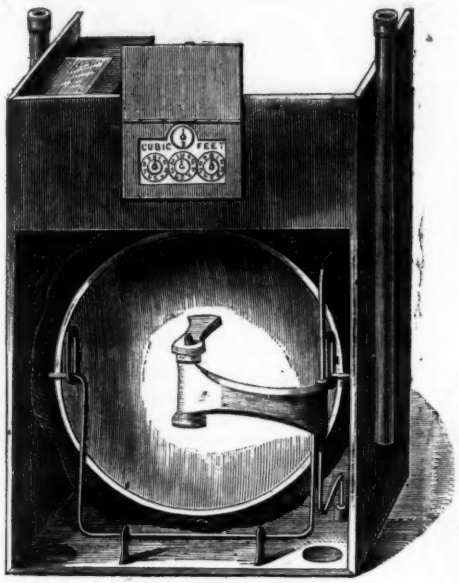
MANUFACTURERS OF

WET AND DRY GAS-METERS,

PRESSURE-GAUGES AND GOVERNORS, AND STREET-LAMP REGULATORS.

FACTORIES:

KING'S ROAD, LONDON, N.W., and GRAY'S INN ROAD, LONDON, W.C.



Front View.

THE

IMPERIAL

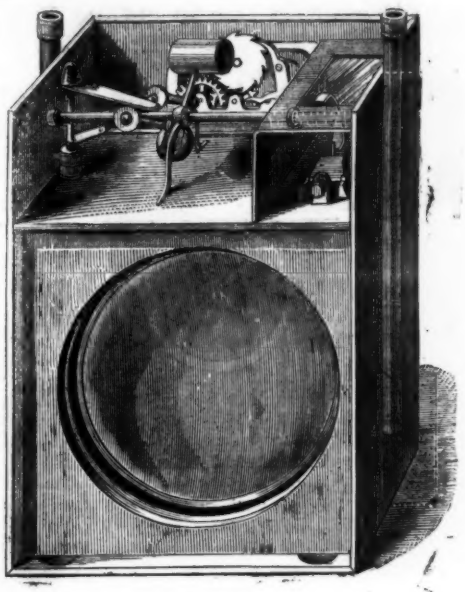
DRY

GAS-METER

SINGLE DIAPHRAGM.

TELLING & JOHNSON'S

PATENT.



Back View.

I. The mechanical construction of this Meter is simpler and stronger than any other.
II. About half as much leather is used as in ordinary dry Meters.
III. The Meter has only one valve, and this cannot "stick."
IV. The lights maintain perfect steadiness and strength of flame. There is no "draw."
V. The gas consumed can only be measured from the inlet to the outlet, and
VI. The index cannot be made to register backwards.

THE IMPERIAL METER COMPANY, LIMITED, ALSO MANUFACTURE ORDINARY DOUBLE DIAPHRAGM DRY GAS-METERS OF ALL SIZES, BOTH IN TIN AND IN CAST-IRON CASES.

SPECIAL ATTENTION

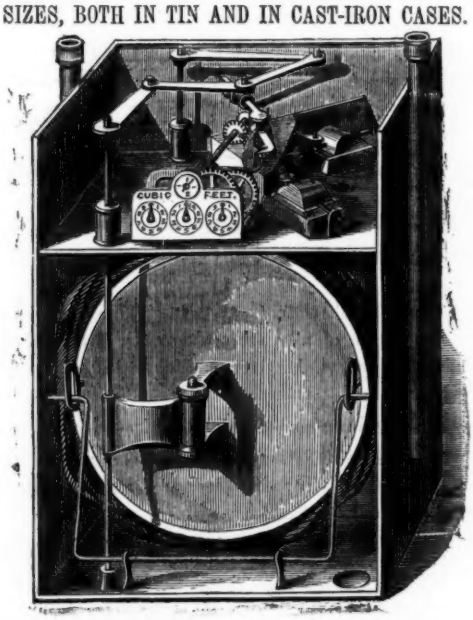
IS PAID TO THE

MANUFACTURE OF

STREET-LAMPS

AND

REGULATORS.



EVERY

DRY GAS-METER

IS UPHELD FOR

SIX YEARS

WITHOUT CHARGE.

THE IMPERIAL DRY GAS-METER.
Double Diaphragm.

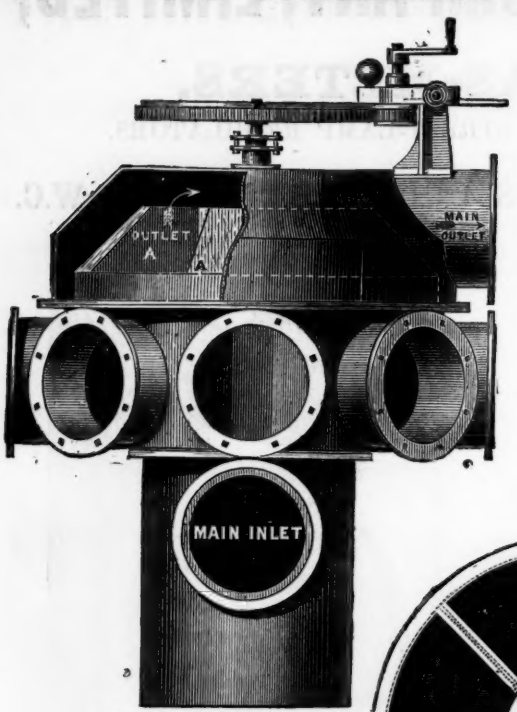
Mr. GEORGE MACKANESS will represent this Company in the Provinces.

OFFICES: 41, FLEET STREET, LONDON, E.C.

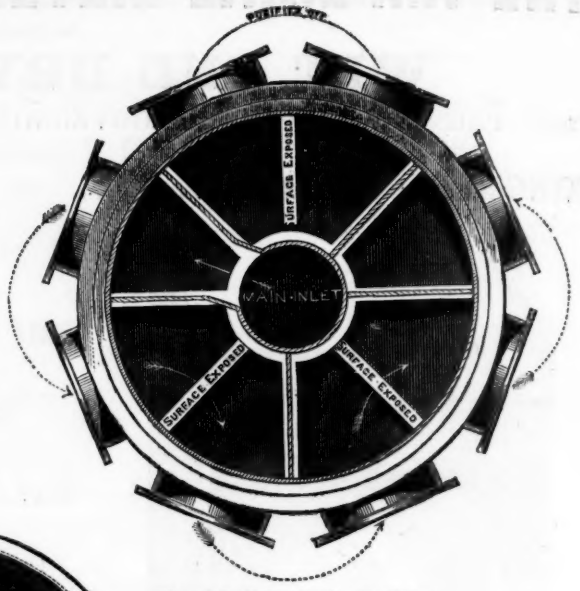
W. MOORE, Secretary.

☞ *All Communications to be addressed to the Secretary.*

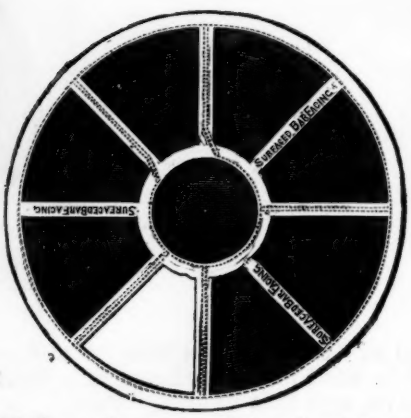
C. & W. WALKERS' PATENT CENTRE-VALVES.



Elevation of the Centre-Valve for four Purifiers. The safety cover is shown broken, to enable the Valve itself, which is inside, to be seen.



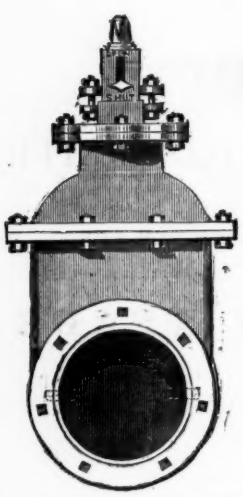
Plan of the Body, showing the Valve lying in it, with three of the facings, which were formerly exposed to settlements of dirt, carbon, naphthaline, &c., but which are now always covered by the surfaced bar-facings of the Valve. (See below.)



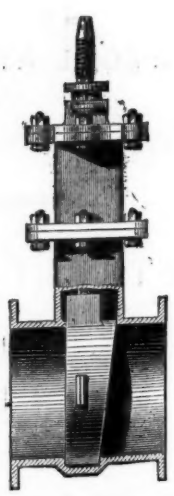
Plan of the Valve, or upper portion, showing the surfaced bar-facings referred to above.

These PATENT CENTRE-VALVES are the most perfect and certain means for working Purifiers. The Valve itself is protected from all injury inside the safety cover. The working of the Valve is so easy, and so governed by the stop-catch movement, that the Purifiers can be instantaneously changed in the dark as well as in daylight. They are scraped perfectly true, metal to metal, the facings heretofore exposed are always covered, and there is nothing more reliable, certain, and durable in a gas-works. By their use the floor of the Purifying-house is clear and level; the Valve and all connexions being beneath the floor, out of the way of working. A very considerable improvement and saving is effected in the cost of the connecting-pipes.

FOUR-WAY CENTRE-VALVES FORMING INLET, OUTLET, AND BYE-PASS.



C. & W. WALKERS'
DOUBLE-FACED GAS-VALVES.



These solidly constructed double-faced Gas-Valves are superseding the old system of the light, single-faced disc, which is too uncertain and unreliable in large bores.

They are guaranteed absolutely gas-tight. They are very massive and rigid, and by improved modes of manufacture they are produced at very little excess in cost over the old light, weak system, which is liable to spring and bend, and become leaky.

The Valve is a rigid wedge of solid cast iron, having two perfectly scraped surfaced facings fitting between the two on the body, which are also surfaced.

A spring in two short halves, and, therefore, not liable to break, is used only for scraping the front facing clean.

The front facing is vertical; the back facing forms the wedge.

At a slight additional expense both flanges are faced to bolt to main-pipes.

GASHOLDERS, TELESCOPE & SINGLE-LIFT, of LARGEST DIMENSIONS.

PURIFIERS, SCRUBBERS, CONDENSERS of most Improved Description.

WOOD SIEVES FOR PURIFIERS,

Which have now been in use for more than ten years, and their advantages and durability fully established. They are made entirely by steam machinery in very large quantities at the most moderate cost.

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MAKERS, BY SPECIAL MACHINERY, OF PATENTED MECHANICAL INVENTIONS,

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CONTRACTORS TO THE EUROPEAN & COLONIAL GOVERNMENTS & CORPORATIONS;

MERCHANTS AND SHIPPERS OF MACHINERY, METALS, AND HARDWARE;

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ALSO THE FIRST PRIZE MEDALS AT LEEDS AND LYONS IN 1858, 1868, and 1872.
"REDUCTION IN PRICES OF PEET'S VALVES, consequent upon largely increased sales."

ILLUSTRATED CATALOGUES AND ESTIMATES ON APPLICATION.

Correspondence conducted in English, German, or French.

Samples of Specialties may be inspected at Stand No. 542, Group XIII., in the English Machinery Annexe of the Vienna Exhibition, 1873. For List of same see German Official and "British Section" Catalogues.

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GAS ENGINEER AND CONTRACTOR FOR THE ERECTION OF GAS-WORKS,
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(HIGHEST AWARD FOR STEAM PUMPS)

HAS BEEN GRANTED FOR THE

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BY THE COMMISSIONERS OF THE

VIENNA EXHIBITION for 1873.

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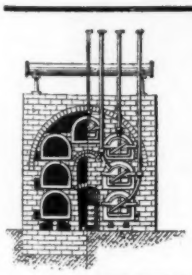
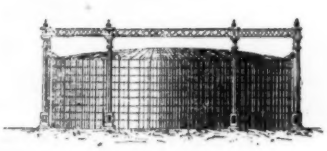
84 and 85, UPPER WHITECROSS STREET, LONDON, E.C.

ILLUSTRATED PRICED CATALOGUES ON APPLICATION.



HENRY SKOINES,

PATENTEE
AND
CONTRACTING
GAS
ENGINEER,
FOR



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Of any extent, at Home or Abroad,

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WELLINGTON TUBE-WORKS,

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STAFFORDSHIRE,

MANUFACTURER OF

PATENT WELDED WROUGHT-IRON TUBES AND FITTINGS.

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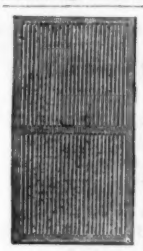
EGLINTON FOUNDRY, GLASGOW,
Manufacturers of all sizes of Cast-Iron Main-Pipes by an improved Patent, General Ironfounders, Gas Engineers, and Wrought-Iron Tube Makers.



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WOOD SIEVES,
WITH TAPER BARS,
MADE BY MACHINERY
CAPABLE OF MAKING 10,000 PER WEEKLY.
References to Hundreds of First-Class Engineers.
ROSE MOUNT IRON-WORKS,
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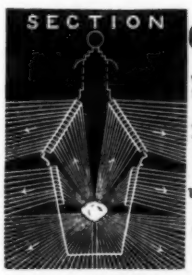
CLOTH GAS-BAGS FOR MAINS,

As supplied to the Imperial, Chartered, and other London and Provincial Gas Companies. Bellows and Valves for inflating Well Dresses, Stokers Gloves, India-Rubber Suction and Delivery Hose, Gas-Tubing, Leather, India-Rubber and Gutta-Percha Machine-Bands, Sheet and Washers for Steam Joints.
T. BUGDEN, Manufacturer,
79, GOSWELL ROAD, LONDON, E.C.



THE PATENT
CATOPTRIC LAMP
for Streets and all Situations where the Light ascending above the level of the Lamp is wasted,
Is now in use in Moorgate St., London, and has been in successful operation upon Waterloo Bridge since Oct. 7, 1871.
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INVENTOR AND PATENTEE.

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SUPPLIED BY
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Prices Quoted on application.

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CAST-IRON GAS AND WATER PIPES AND FURNISHINGS.
MALLEABLE IRON TUBE FOR GAS, WATER, AND STEAM.
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DELIVERY F.O.B. ON CLYDE.
Lists on application.

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DEPOT for STOURBRIDGE AND NEWCASTLE FIRE-BRICKS, LUMPS, TILES, and FIRE-CLAY, and every Article suitable for
GAS AND WATER WORKS.

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BEST GLASS-HOUSE POT and CRUCIBLE CLAYS.
Successors to
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DESIGNS, SPECIFICATIONS, & ESTIMATES FURNISHED.

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MANUFACTURERS AND CONTRACTORS FOR
GAS APPARATUS, GASHOLDERS, TANKS, VALVES, IRON ROOFS, GIRDERS, BRIDGES, &c.,
CALEDONIA IRON-WORKS, PAISLEY.

Attention is requested to
BRODIE'S IMPROVED GAS APPARATUS,
Admitted to be the best and most economical for lighting factories, railway stations, mansions, country houses, and other isolated buildings.

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WILLIAM FRASER,
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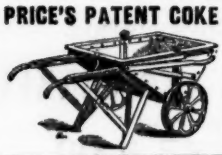
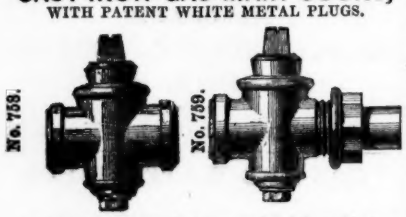
(Owner of the Works at which Fire-Clay Retorts were first made), can supply
RETORTS, FIRE-BRICKS, &c.,
to any extent.
References can be given to managers of above a hundred Gas-Works whom he supplies.
He ships at Charlestown his
CELEBRATED HALBEATH STEAM COALS,
on Navy List.

PRICE'S PATENT COKE & COAL BARROW,



effecting a great saving of time, labour, and expense.
For particulars, price, &c., apply to Mr. E. PRICE, Inventor and Patentee, Gas-Works, Hampton Wick, MIDDLESEX.

LAMBERT'S
CAST-IRON GAS-MAIN COCKS,
WITH PATENT WHITE METAL PLUGS.



The bodies of these Taps are made of Iron, black or galvanized, and the Plugs of Patent Metal. They are warranted not to set fast or corrode as do iron or brass Cocks, will always work easily, are strong, well made, durable, of little or no intrinsic value, and, therefore, not likely to be stolen; and the PRICES are (especially upon the larger sizes) FULLY 50 PER CENT. LESS THAN BRASS COCKS.

GAS-JOINTS, CHANDELIERS, PENDANTS, BRACKETS, ETC.;
WROUGHT-IRON WELDED TUBE AND FITTINGS,
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Stocks, Taps, and Dies, and Every Description of Gas-Fitters Tools; Gas Slide and Sluice Valves;
CARTER'S SAFETY GAS-VALVES;
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TO GAS COMPANIES, ENGINEERS, CONTRACTORS, AND OTHERS.

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LAMP METERS AND BOXES,
GOVERNORS, GAUGES, INDICATORS, EXHAUST & PRESSURE REGISTERS,
GAS STATION-METERS,
With all the joints planed.
TERMS, &c., ON APPLICATION.

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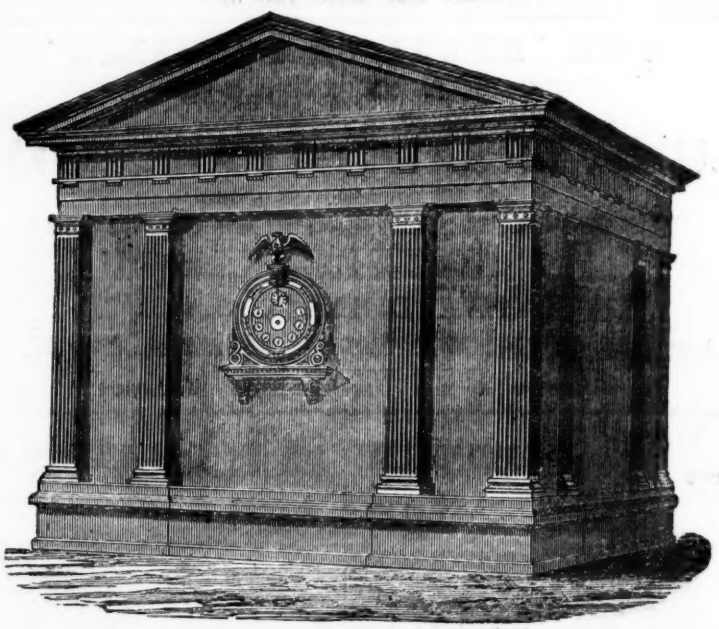
GAS ENGINEERS,
GLOBE METER-WORKS, OLDHAM,
MANUFACTURERS OF
IMPROVED CONSUMERS GAS-METERS,
Of the best material and workmanship, carefully adjusted to the requirements of the British Sales of Gas Act and Foreign Standards of Measures.
PATENT FIXED WATER-LINE GAS-METERS,
Which are uniform with the ordinary Meters, and register with minute accuracy.
IMPROVED DRY GAS-METERS,
IN BEST TINNED IRON CASES.



GAS STATION-METERS,
WITH PLANED JOINTS.
GOVERNORS, GAUGES, INDICATORS, EXHAUST-GOVERNORS, &c.
Home and Foreign Orders promptly attended to.
All Sizes of CONSUMERS METERS, STATION-METERS, and GOVERNORS generally in Stock.
Orders almost invariably despatched on the day of receipt.
TERMS, &c., ON APPLICATION.

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MANUFACTURERS OF CRYSTAL GLASS CHANDELIERS,

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TABLE GLASS OF ALL KINDS.

CHANDELIERS IN BRONZE AND ORMOLU. MODERATOR LAMPS.

GEORGE ORME & CO.,

GAS-METER MANUFACTURERS, BRASSFOUNDERS & FINISHERS,

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CONSUMERS WET & DRY GAS-METERS ON THE MOST APPROVED PRINCIPLES.

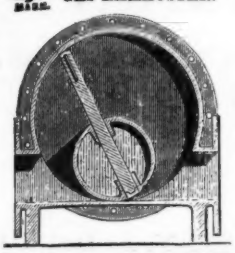
STATION-METERS, GOVERNORS, PRESSURE-REGISTERS,

And every Description of Gas Apparatus.

GAS, STEAM, AND WATER FITTINGS.

TRADE MARK.

J. BEALE'S PATENT GAS EXHAUSTER.



BEALE'S CONTINUOUSLY ACTING

GAS EXHAUSTERS

ARE NOW MANUFACTURED BY

B. DONKIN & CO.

MR. J. BEALE, of East Greenwich, having retired from business, has made an arrangement with B. DONKIN & CO. for the sole manufacture of his Patent Solid-Slide Gas Exhausters.

B. D. & Co. also make Steam-Engines to drive Gas Exhausters direct or otherwise.

Estimates and Prices on application to

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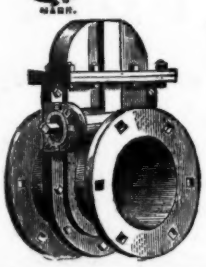
ENGINEERS & IRONFOUNDERS,

BERMONDSEY, LONDON, S.E.

B. DONKIN & CO.'S IMPROVED GAS-VALVES

TRADE MARK.



WITH WROUGHT-IRON PINIONS,

List of prices, with full dimensions of all sizes up to 48-inch, to be had on application.

These Valves are all proved on both sides to 30 lbs. on the square inch before leaving the works, and are always kept in stock.

VALVES MADE WITH OUTSIDE RACKS TO ORDER.

ALSO,

SCREW WATER-VALVES WITH GUN-METAL FACES.

B. DONKIN & CO.,

GENERAL ENGINEERS AND IRONFOUNDERS,

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LONDON, S.E.

TO GAS COMPANIES AND THE TRADE.

J. DEFRIES & SONS,

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CRYSTAL, BRONZED, & ORMOLU CHANDELIERS, IMPROVED CRYSTAL STAR & SUN LIGHTS, VESTIBULE LAMPS, AND THE PATENT CRYSTAL ILLUMINATION.

A LARGE STOCK ALWAYS IN HAND OF

IRON, BRASS, COMPOSITE, AND LEAD TUBES, FOR GAS AND WATER,

AND EVERY DESCRIPTION OF

GAS AND WATER FITTINGS.

THE PATENT DRY AND WET METER, WITH THE LATEST IMPROVEMENTS.

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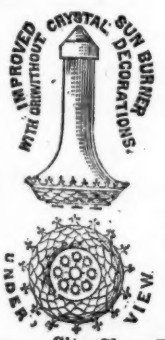

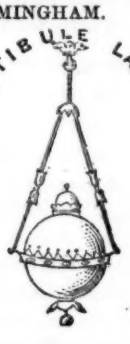

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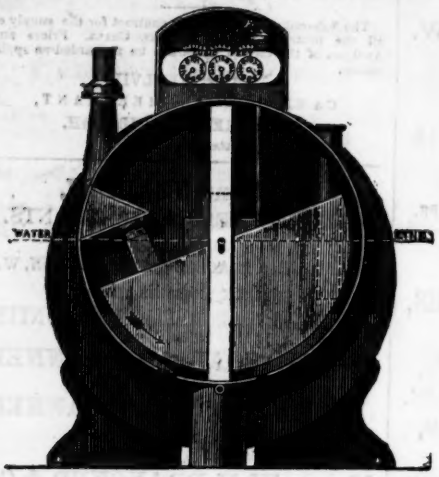

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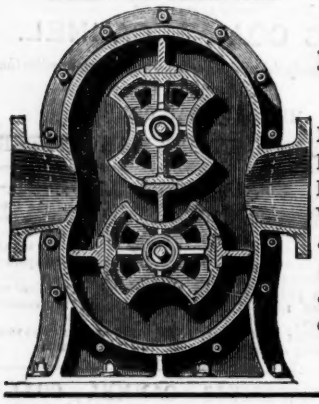

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